CARLO GAVAZZI

Automation Components

A Lifetime of Commitment to Automation

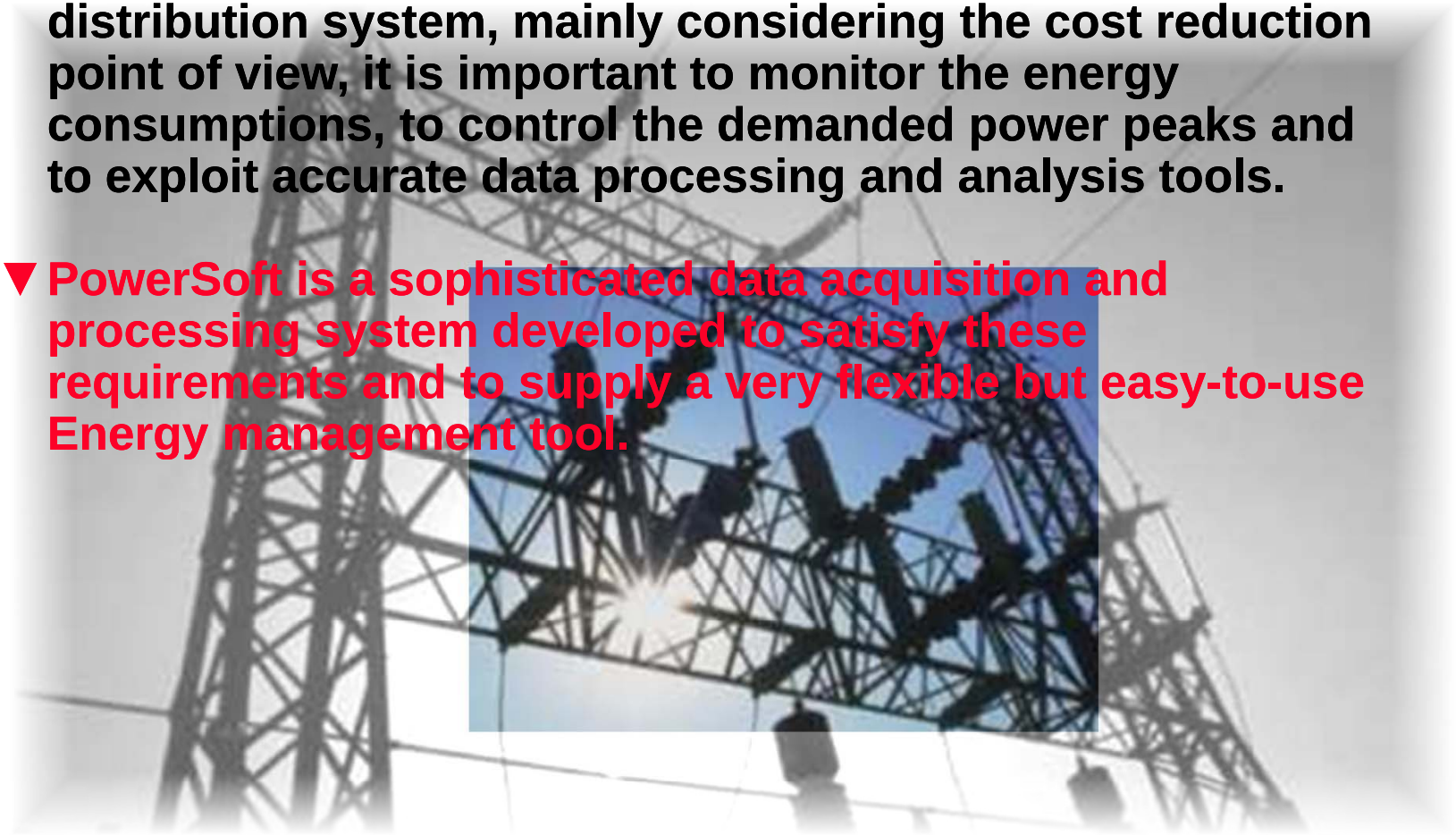
PowerSoft

The Energy Manager

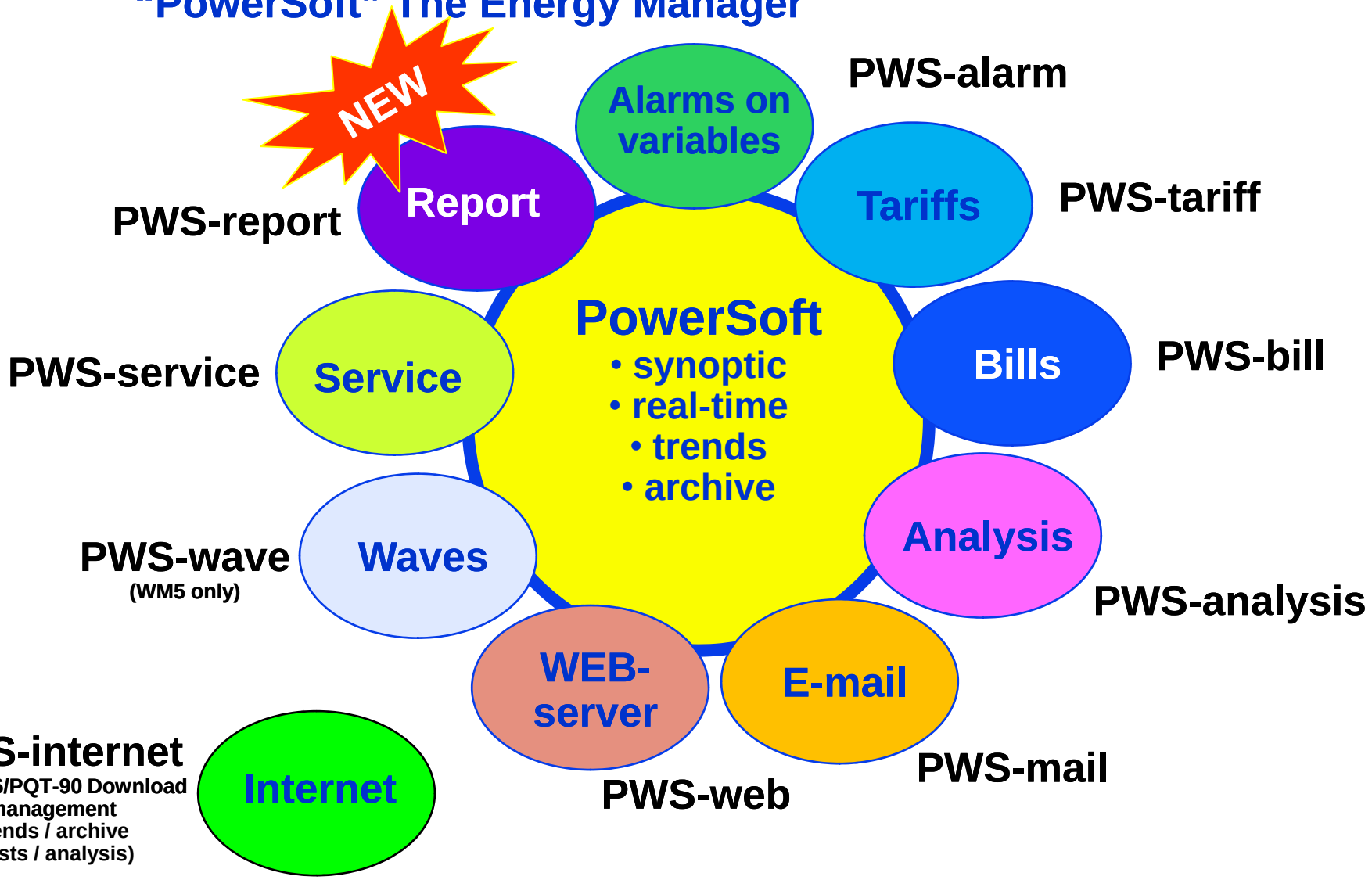
Introduction

- To correctly and efficiently manage any electrical distribution system, mainly considering the cost reduction point of view, it is important to monitor the energy consumptions, to control the demanded power peaks and to exploit accurate data processing and analysis tools.

- PowerSoft is a sophisticated data acquisition and processing system developed to satisfy these requirements and to supply a very flexible but easy-to-use Energy management tool.



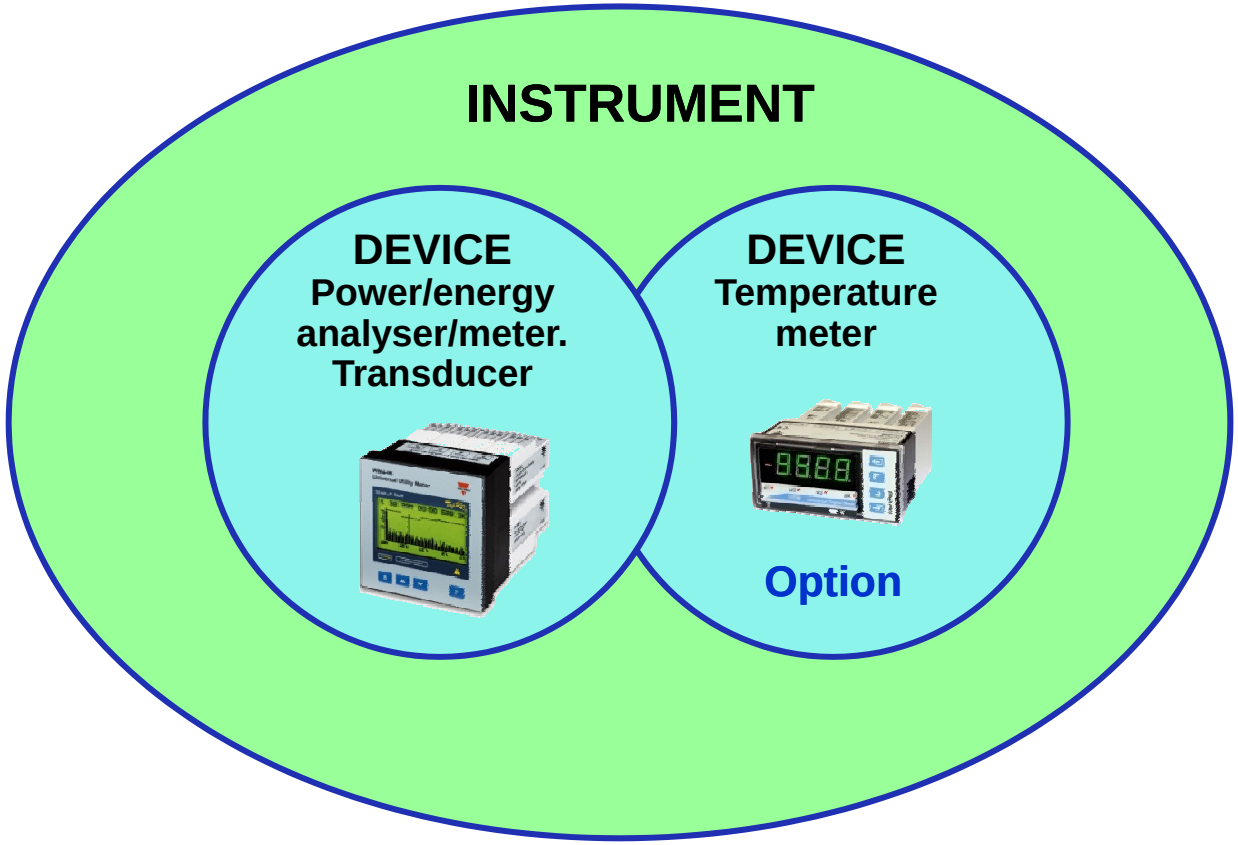
"PowerSoft" The Energy Manager



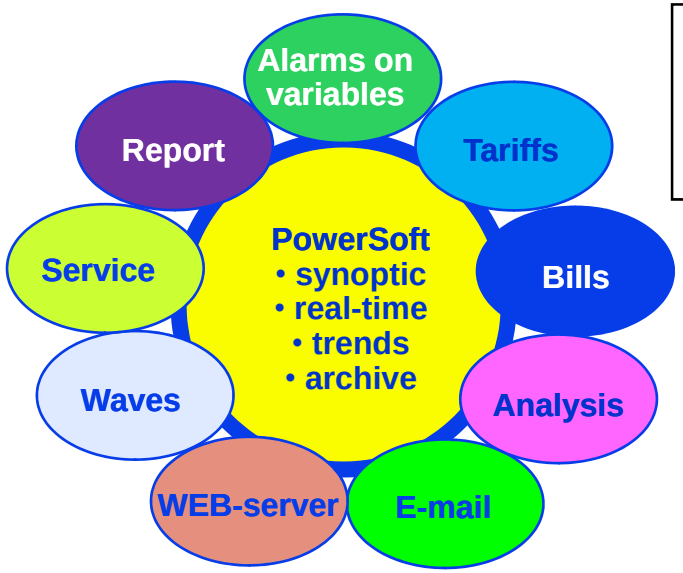
The compatible instruments

Available drivers

- Power analyzers: WM12, WM14, WM22-DIN, WM3-96, WM4-96, WM5-96
- Energy analyzers EM21, EM24-DIN, EM26-96
- Energy meters EM4-DIN
- Transducers CPT-DIN, SPT-M, PQT-90, PQT-H



The safety levels

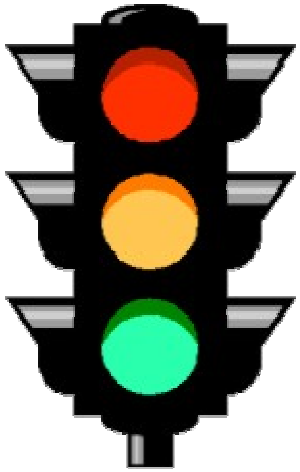


Access to all the "User's functions and, in addition, can configure PowerSoft and all the relevant modules.

Administrator

Logged user

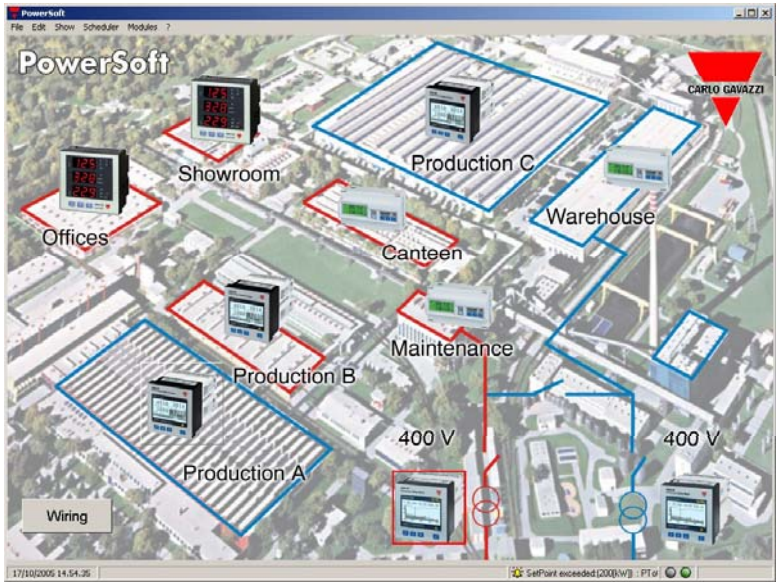
Non-logged user



Access to all the data, acknowledge the alarms, and ask for any report, also via web-server.

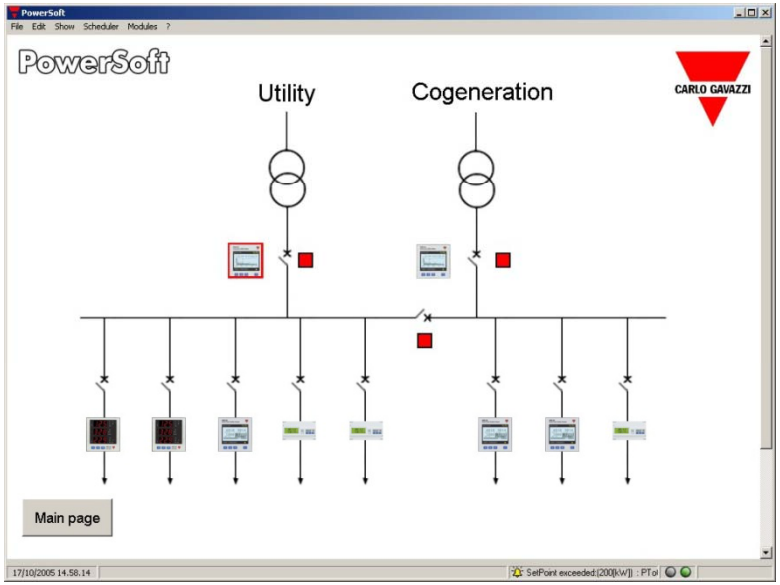
Without password, access only to the real-time values and display the active alarms list.

The Core



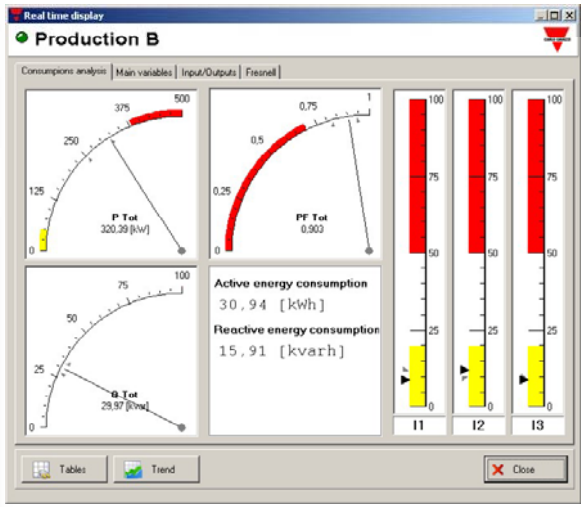
- Monitor your distribution system
- See any alarm condition at a glance
- Browse among instruments and synoptic

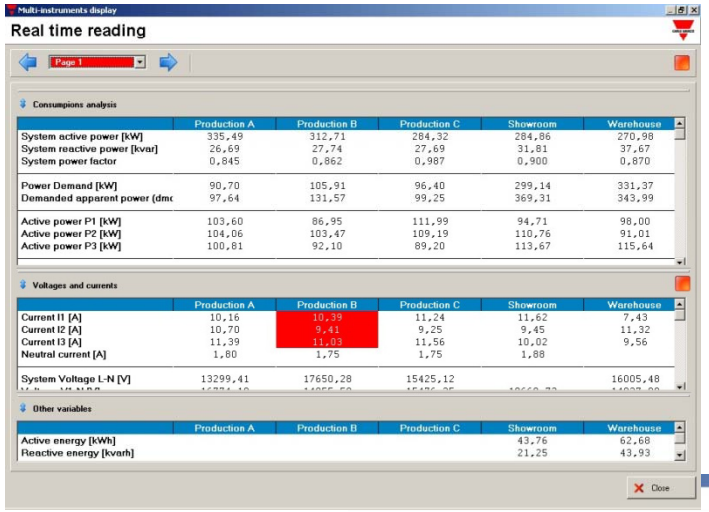
PowerSoft
- synoptic
- real-time
- trends
- archive
- communication alarms



Energy Management PowerSoft

The Core

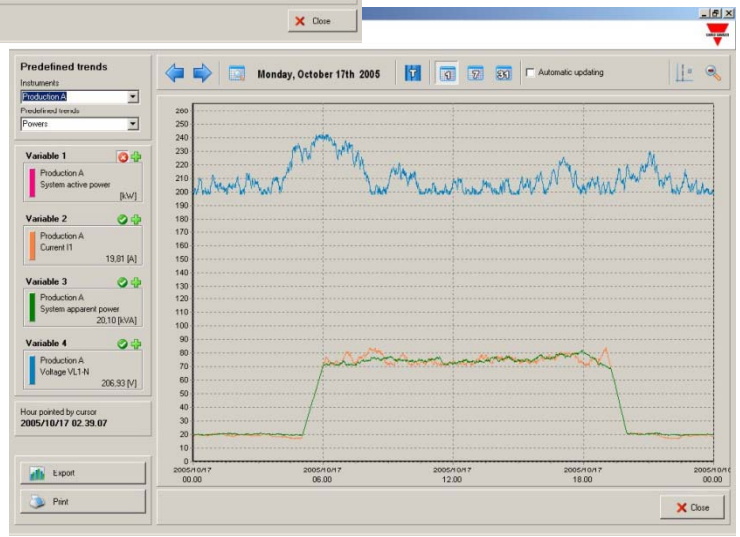



Multi-instruments display
Real time reading
Consumptions analysis
Production A
Production B
Production C
Showroom
Warehouse
System active power [kW] 335,49 312,71 284,32 284,86 270,98
System reactive power [kvar] 26,69 27,74 27,69 31,81 37,67
System power factor 0,845 0,862 0,987 0,900 0,870
Power Demand [kW] 90,70 105,91 96,40 299,14 331,37
Demanded apparent power (dmc 97,64 131,57 99,25 369,31 343,99
Active power P1 [kW] 103,60 86,95 111,99 94,71 98,00
Active power P2 [kW] 104,06 103,47 109,19 110,76 91,01
Active power P3 [kW] 100,81 92,10 89,20 113,67 115,64
Voltages and currents
Current I1 [A] 10,16 10,33 11,24 11,62 7,49
Current I2 [A] 10,70 9,41 9,25 9,45 11,32
Current I3 [A] 11,39 11,03 11,56 10,02 9,56
Neutral current [A] 1,80 1,75 1,75 1,88
System Voltage L-N [V] 13299,41 17650,28 15425,12 16005,48
Other variables
Active energy [kWh] 43,76 62,68
Reactive energy [kvarh] 21,25 43,93
Close

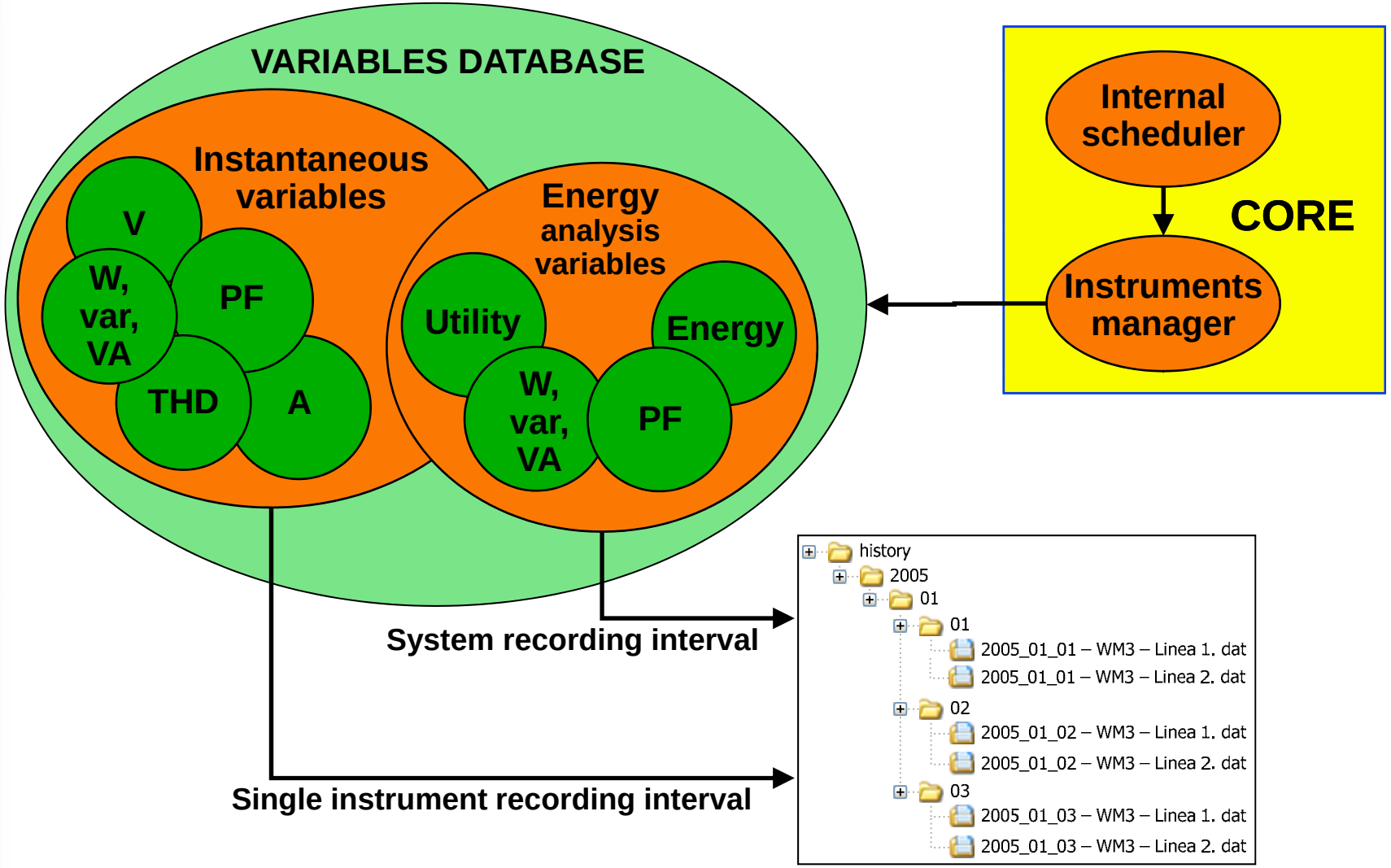
- Trends exportable in WMF format
- Analytical trend and data archive exportable in XLS format

PowerSoft
- synoptic
- real-time
- trends
- archive
- communication alarms

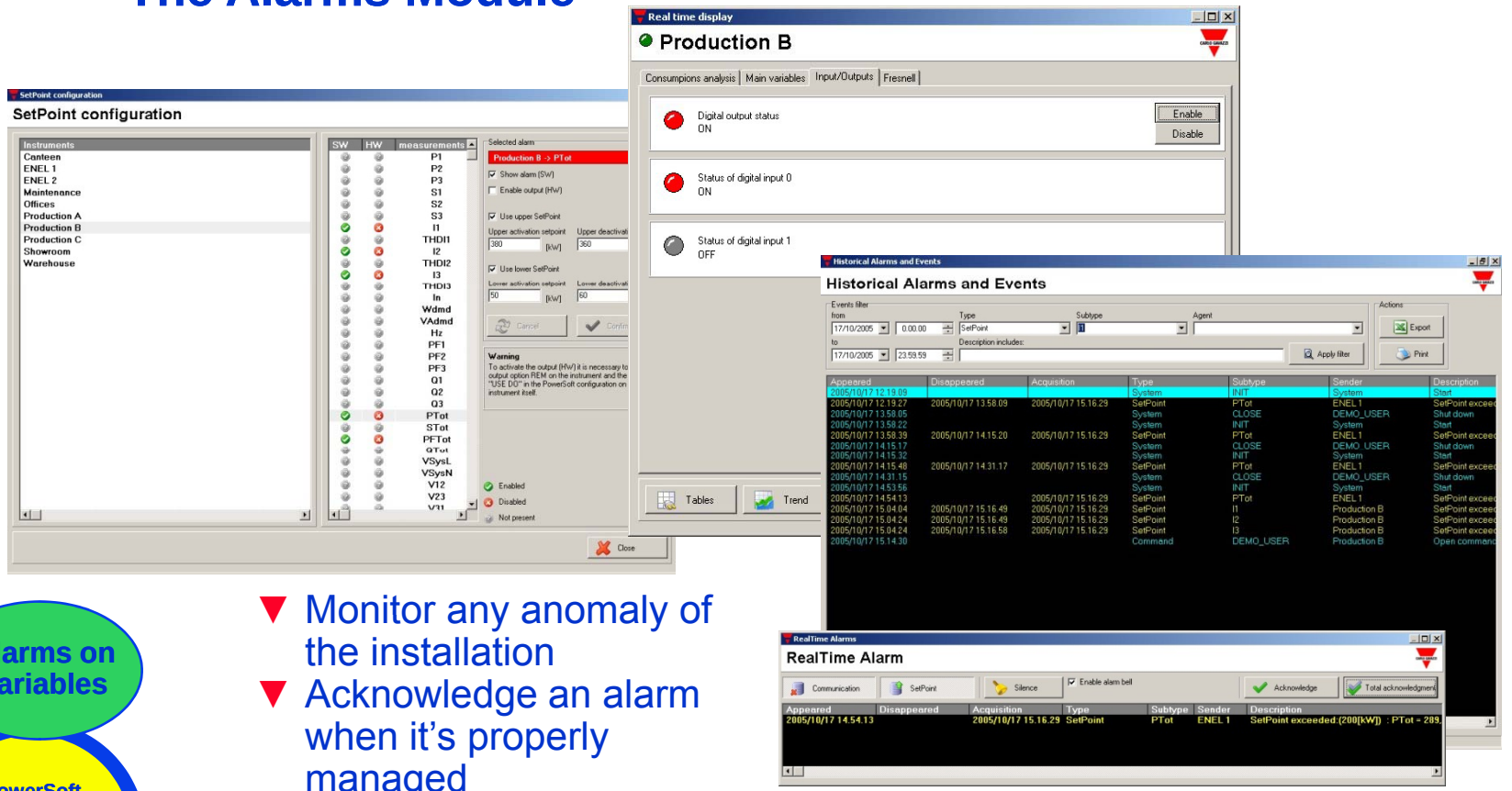
- Different ways of data presentation
- Check the inputs status and act on the outputs
- Carry out a comparison among the meters



The variables database (real-time mode)



The Alarms Module

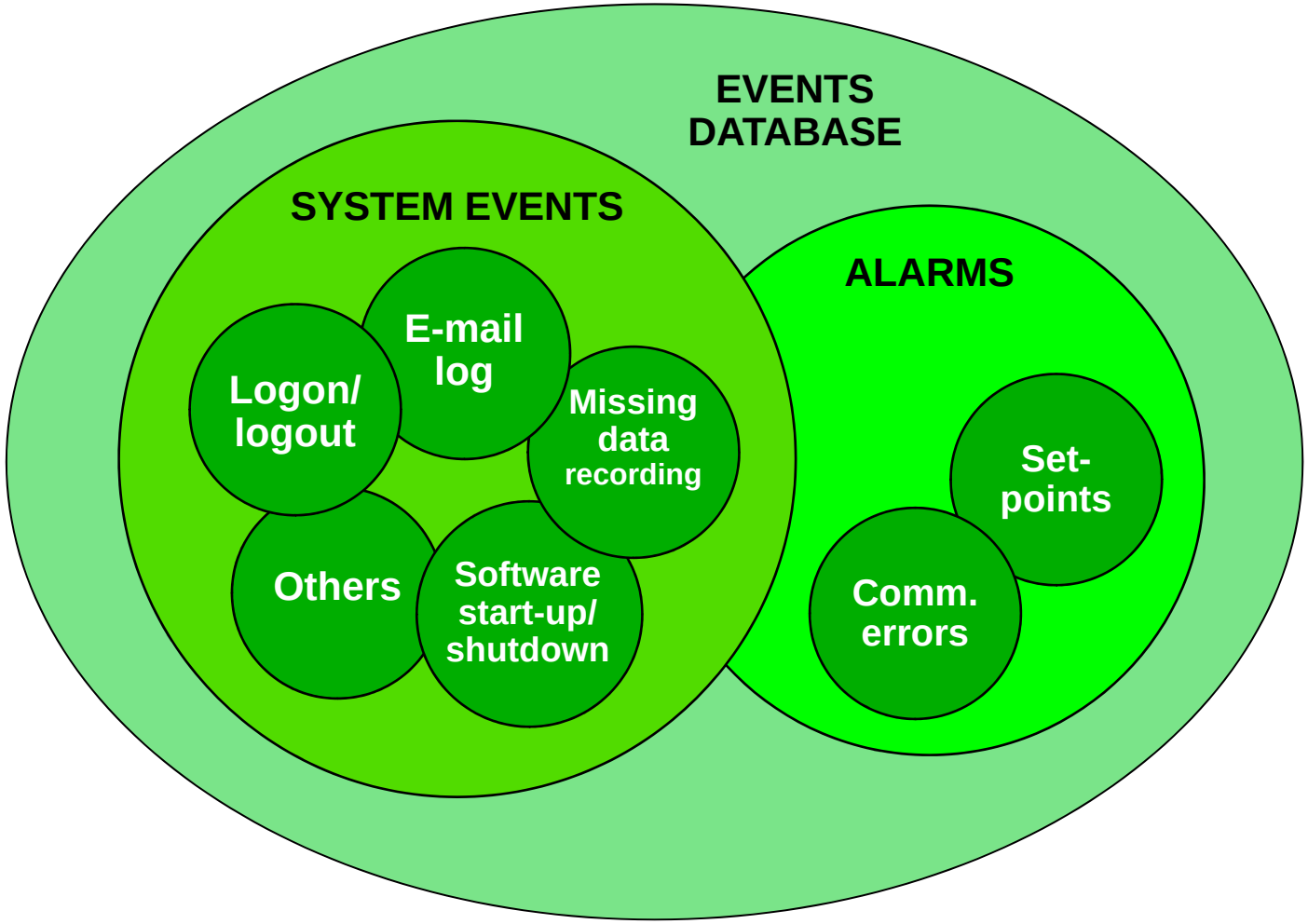


Alarms on variables

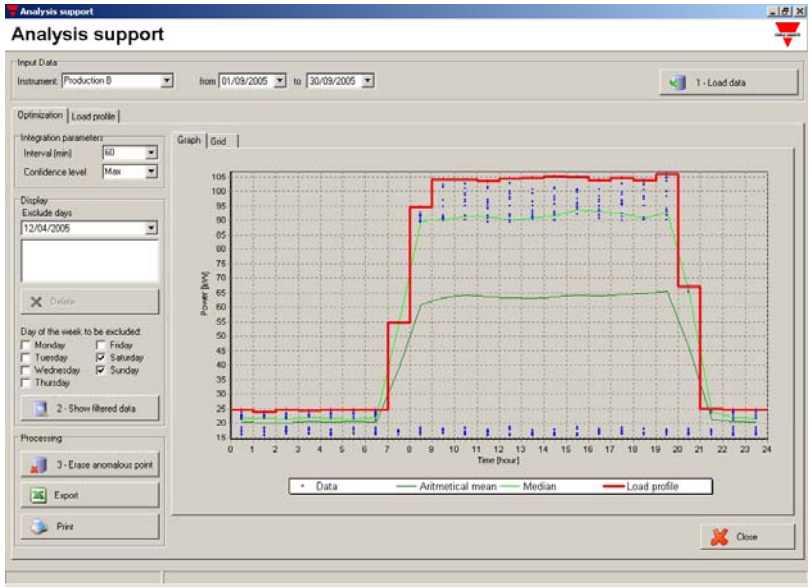
PowerSoft
- synoptic
- real-time
- trends
- archive

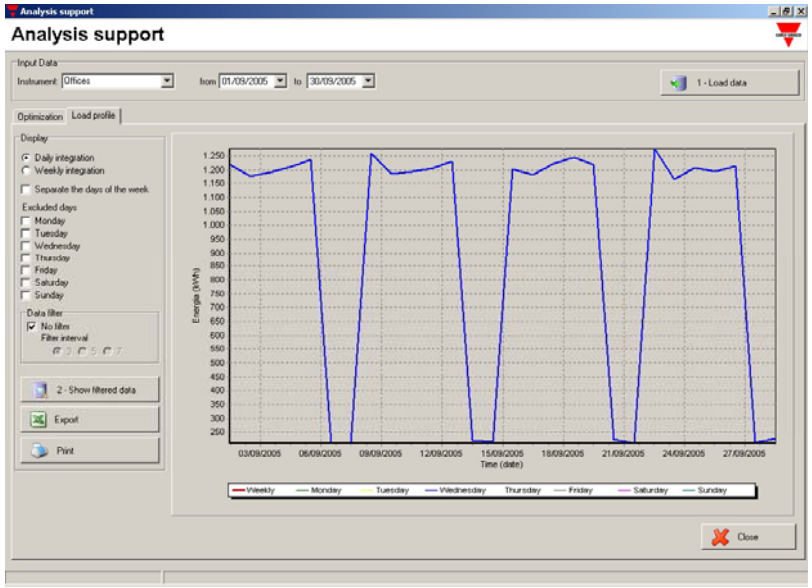
- Monitor any anomaly of the installation
- Acknowledge an alarm when it's properly managed
- Transmit the alarm condition to the meter output
- Access the archive of the alarms
- Logging of the system events
- Export the data
- Filter-base search

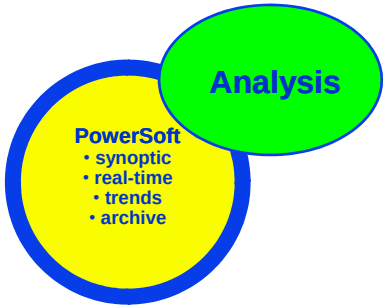
The events database



The Analysis Module





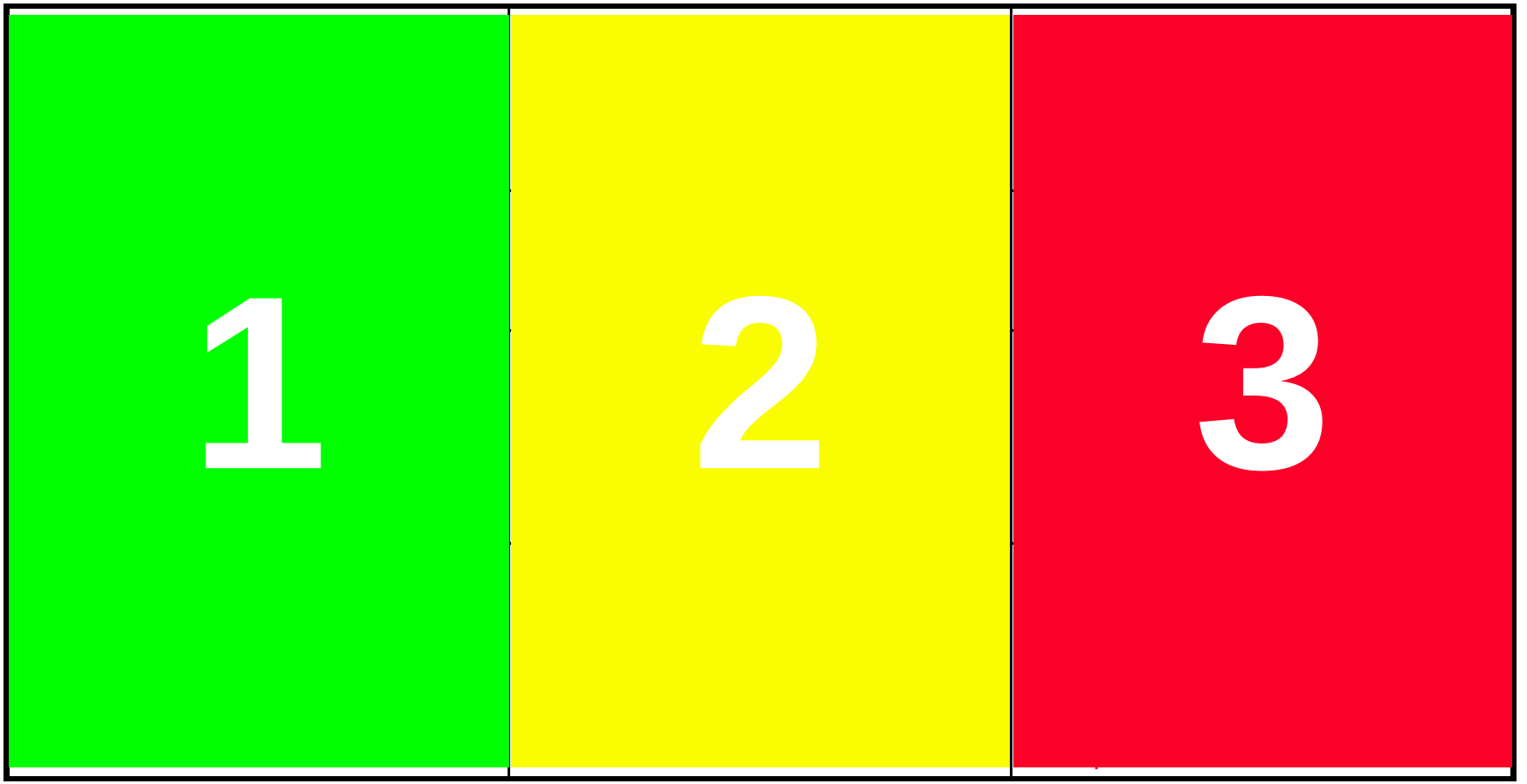


- Check your load profile
- Identify the trend of the power demand
- Negotiate a better contract with the supplier
- Filter any external events which modified the consumption

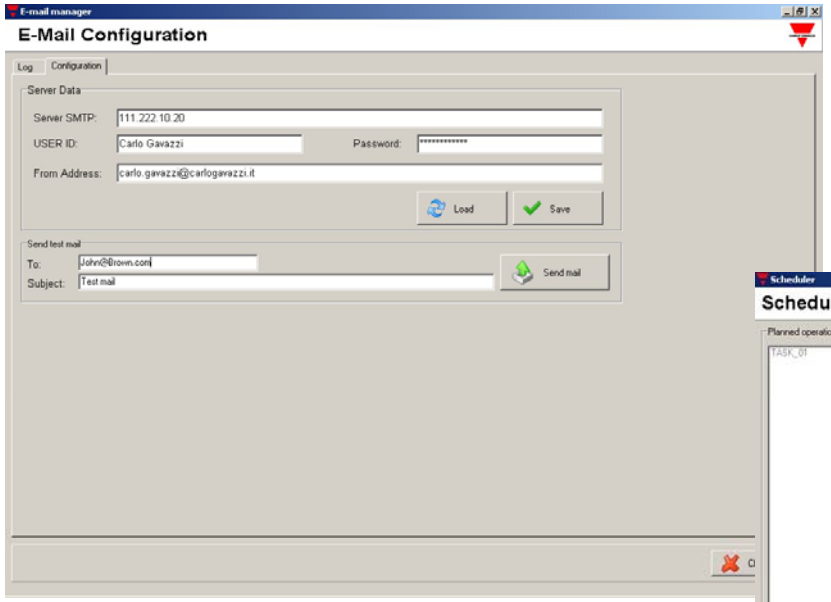
… focus on the fixed cost

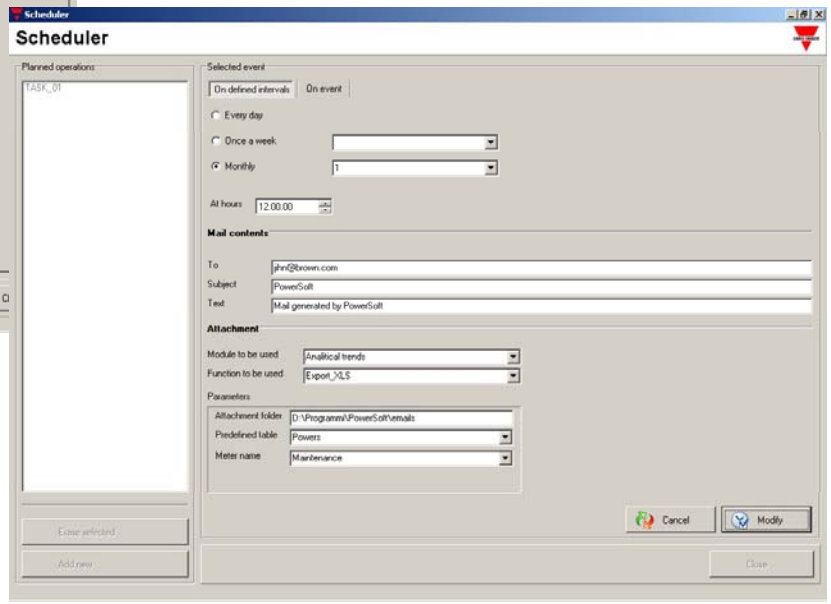
Three examples of contracts to clarify the over-demand calculation

- The Utility charges you an extra amount when you exceed the contractual power.



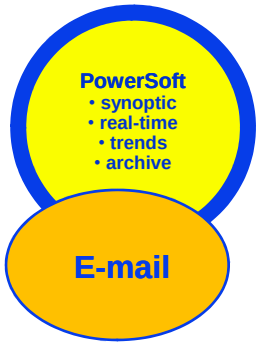
The E-mail Module





Automatic or manual electronic mailing with:

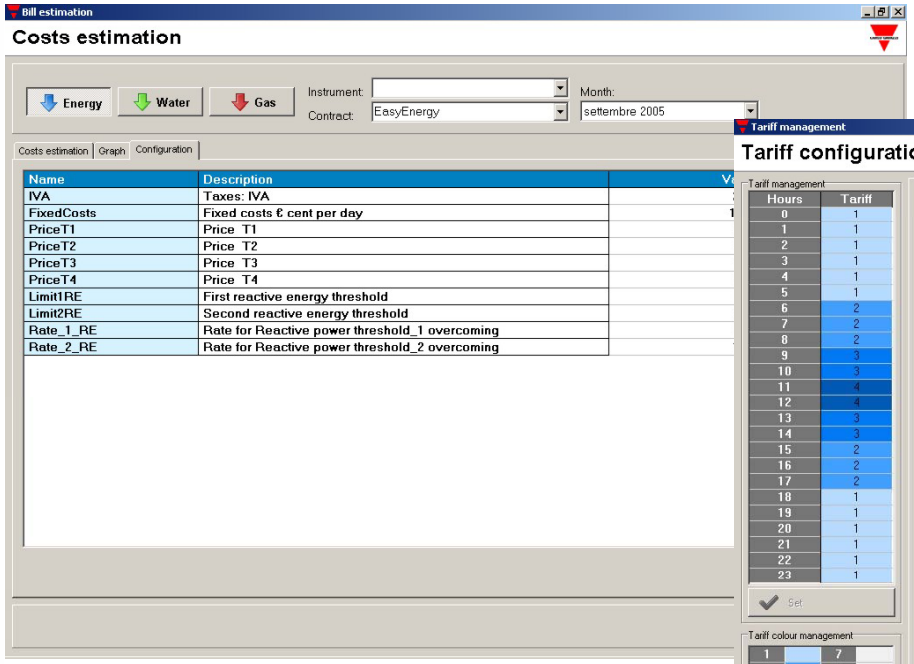
- alarms status
- graph attachments (WMF)
- Data tables (CSV)
- Excel spread sheet (XLS)

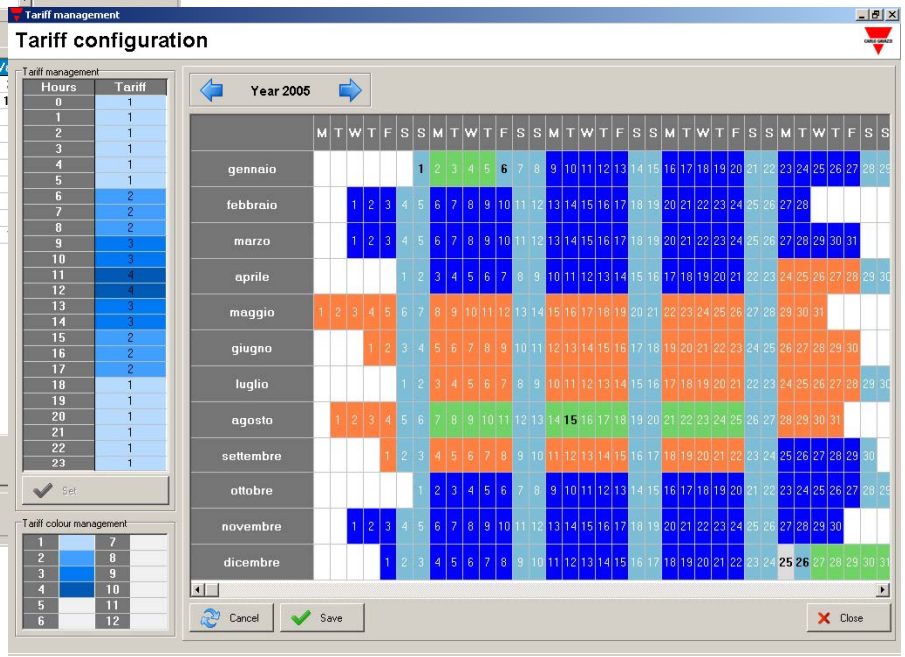


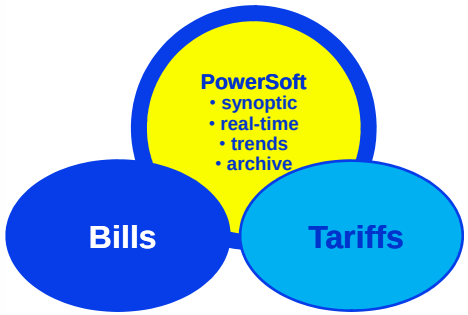
- Notify by e-mail the electrical system status
- Automatic e-mailing on events or on regular basis

The Billing and Tariff Modules

- Tariff configuration (max 12 daily tariffs per 365 days)
- Management of holiday, weekend and festivities

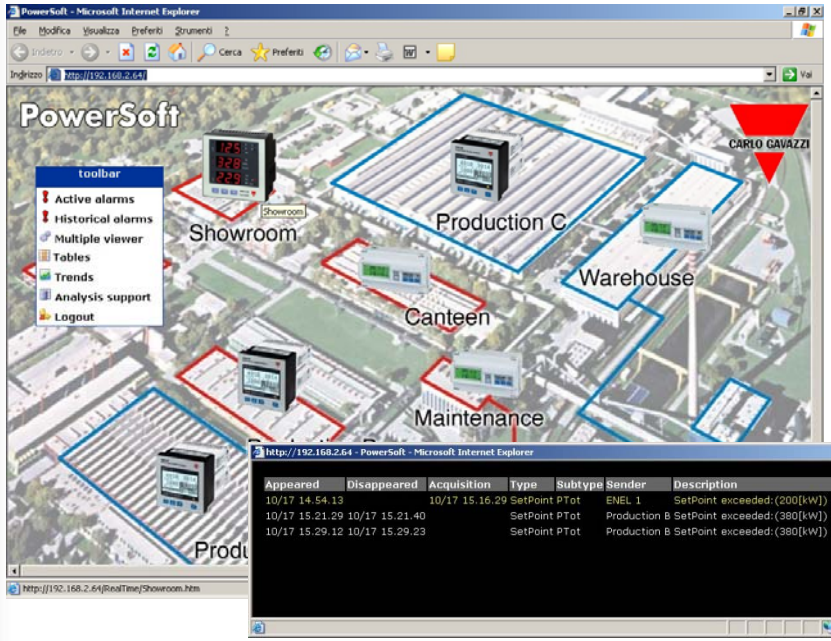






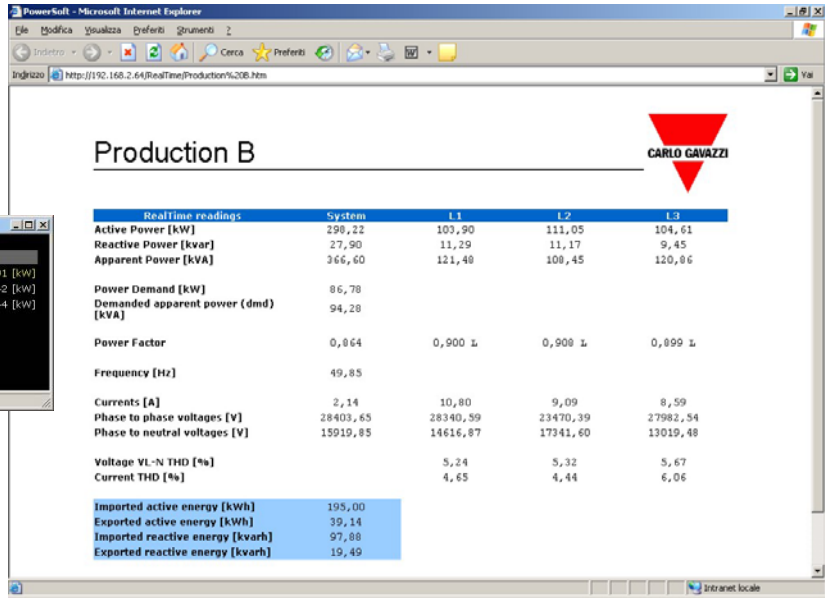
- Estimate the energy and utility costs
- Perform the cost allocation
- Identify the reasons of any penalty
- Split the costs in a multi-tariff system

The WEB server Module


PowerSoft - Microsoft Internet Explorer
PowerSoft
CARLO GAVAZZI
toolbar
Active alarms
Historical alarms
Multiple viewer
Tables
Trends
Analysis support
Logout
Showroom
Production C
Warehouse
Canteen
Maintenance
http://192.168.2.64 - PowerSoft - Microsoft Internet Explorer
Appeared Disappeared Acquisition Type Subtype Sender Description
10/17 14.54.13 10/17 15.16.29 SetPoint PTot ENEL 1 SetPoint exceeded:(200[kW]) : PTot = 289,91 [kW]
10/17 15.21.29 10/17 15.21.40 SetPoint PTot Production B SetPoint exceeded:(380[kW]) : PTot = 413,42 [kW]
10/17 15.29.12 10/17 15.29.23 SetPoint PTot Production B SetPoint exceeded:(380[kW]) : PTot = 385,44 [kW]

WEB-server functionality based on:

- Real-time data
- Trends
- Alarms


PowerSoft - Microsoft Internet Explorer
Production B
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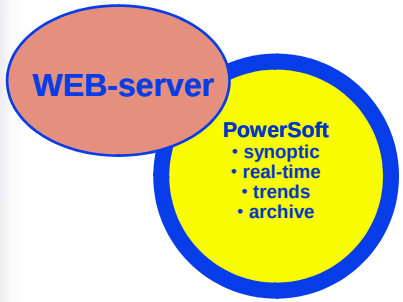
RealTime readings System L1 L2 L3
Active Power [kW] 298,22 103,90 111,05 104,61
Reactive Power [kvar] 27,90 11,29 11,17 9,45
Apparent Power [kVA] 366,60 121,48 108,45 120,06
Power Demand [kW] 86,78
Demanded apparent power (dmd) [kVA] 94,28
Power Factor 0,864 0,900 L 0,900 L 0,899 L
Frequency [Hz] 49,85
Currents [A] 2,14 10,80 9,09 8,59
Phase to phase voltages [V] 28403,65 28340,59 23470,39 27982,54
Phase to neutral voltages [V] 15919,85 14616,87 17341,60 13019,48
Voltage VL-N THD [%] 5,24 5,32 5,67
Current THD [%] 4,65 4,44 6,06
Imported active energy [kWh] 195,00
Exported active energy [kWh] 39,14
Imported reactive energy [kvarh] 97,88
Exported reactive energy [kvarh] 19,49



- Access PowerSoft via standard browser without any additional licence wherever you are

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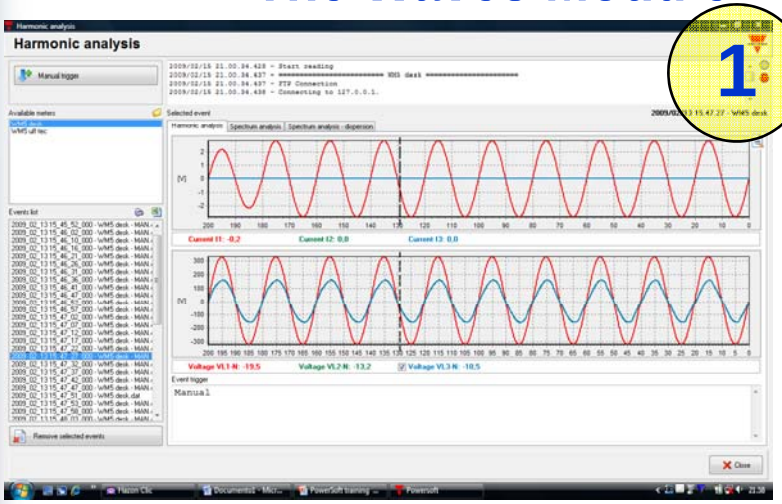
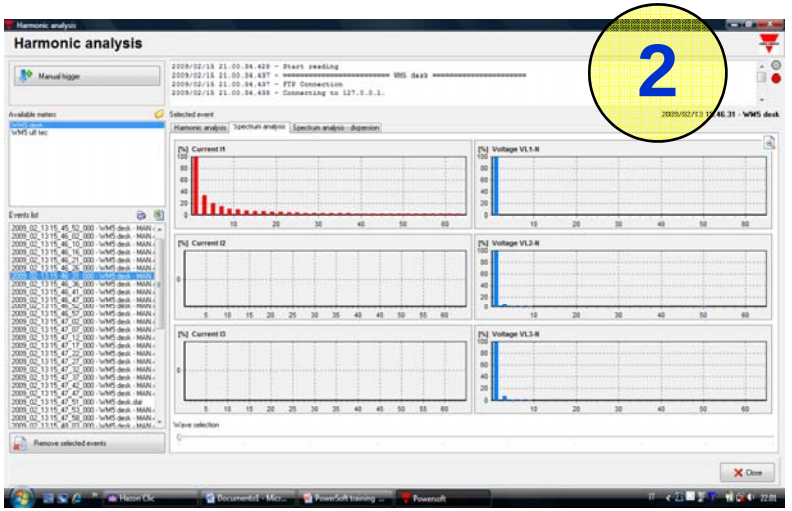
The Waves Module

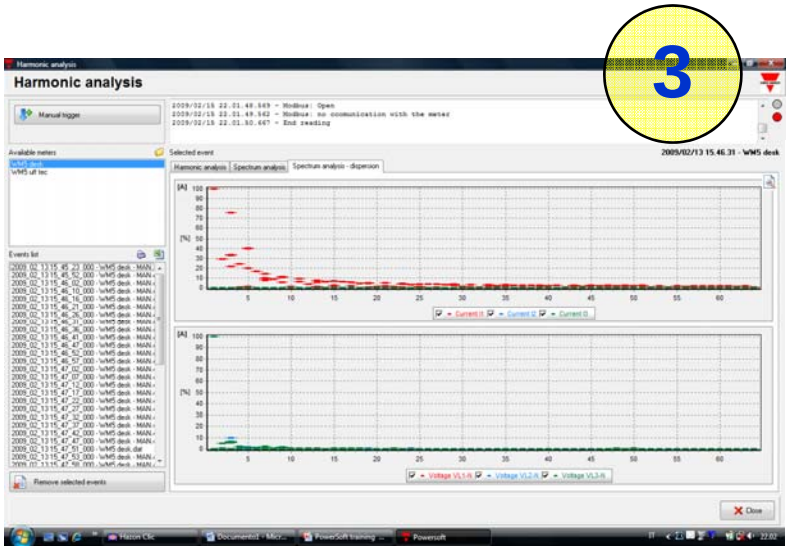


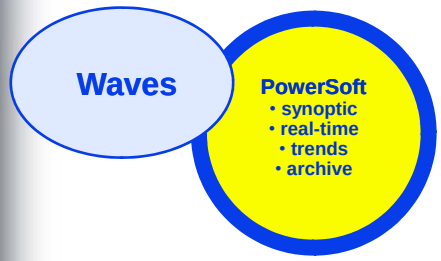


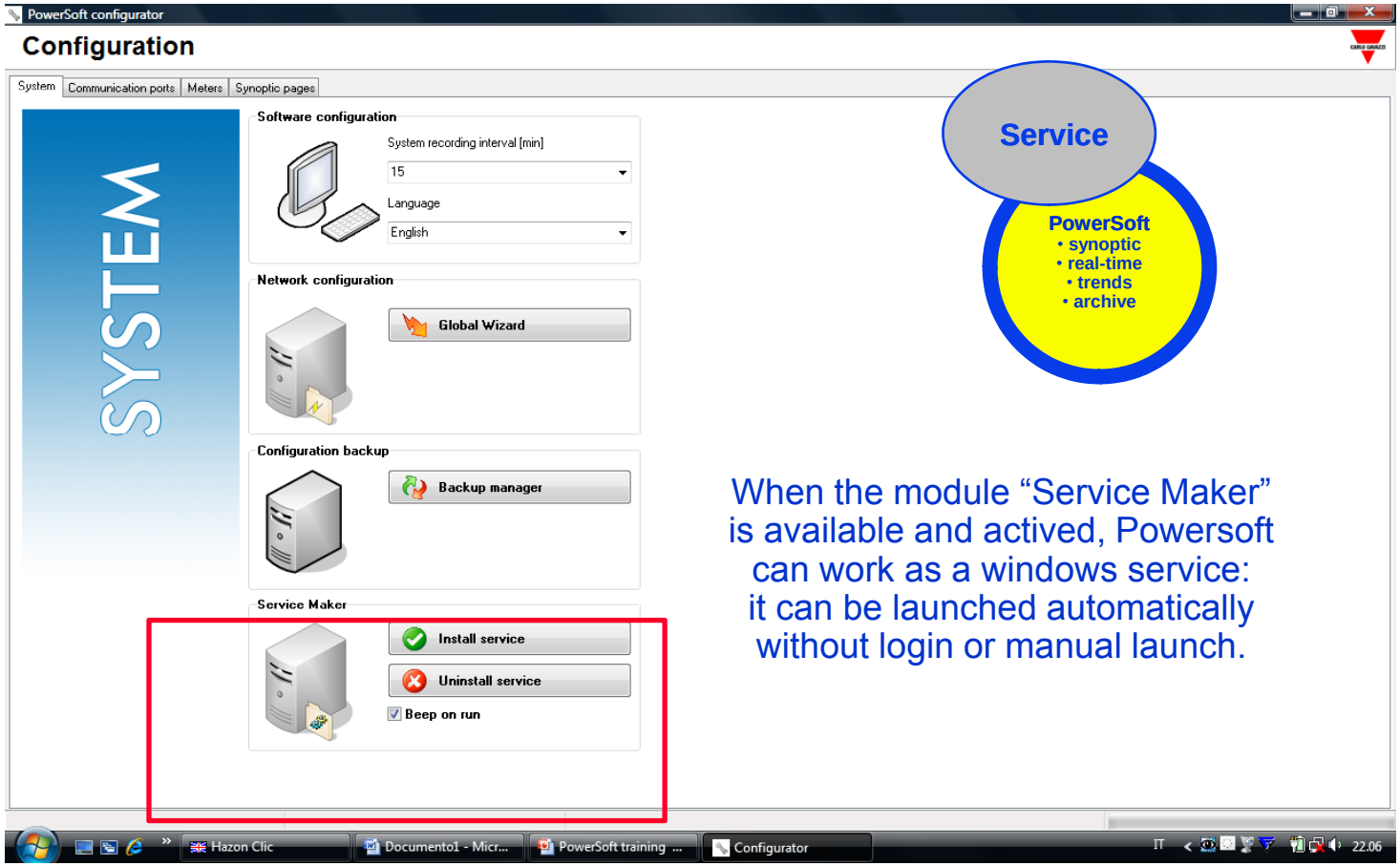
Waves functionality based on:

- Harmonics analysis (1)
- Spectrum analysis (2)
- Spectrum analysis - dispersion (3)

The Waves capability can be used with the WM5 only and performing the serial communication through the AR1061 module.

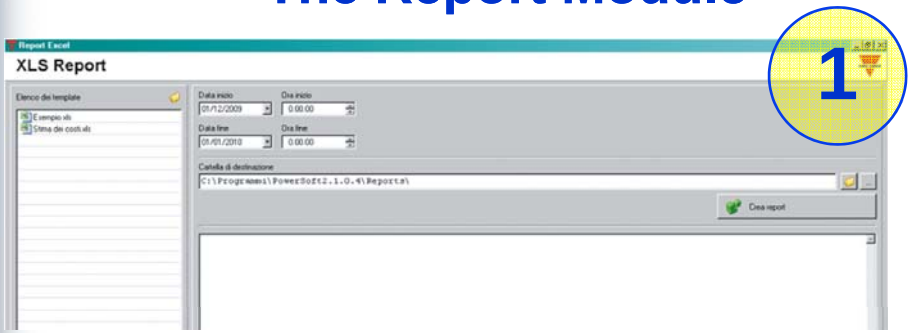





PowerSoft configurator
Configuration
System
Communication ports
Meters
Synoptic pages
SYSTEM
Software configuration
System recording interval [min]
15
Language
English
Network configuration
Global Wizard
Configuration backup
Backup manager
Service Maker
Install service
Uninstall service
Beep on run
Service
PowerSoft
• synoptic
• real-time
• trends
• archive
When the module “Service Maker” is available and actived, Powersoft can work as a windows service: it can be launched automatically without login or manual launch.
Hazon Clic
Documento1 - Micr...
PowerSoft training ...
Configurator
22.06

CARLO GAVAZZI

The Report Module



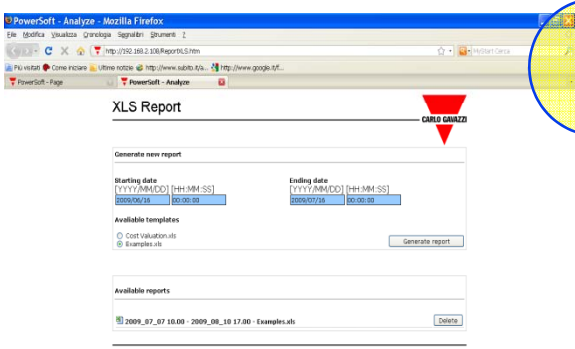
1

01 - TCP_01					
Starting report	2010/03/01 00.00.00				
Ending report	2010/04/01 00.00.00				
Costi					
	%	Quantity	Unità	Unit Price [€]	Subtotals
Fixed cost					10
T1		#sum_T1 kWh+ 01 - TCP_01	kWh	0,17	#VALORE!
T2		#sum_T2 kWh+ 01 - TCP_01	kWh	0,15	#VALORE!
T3		#sum_T3 kWh+ 01 - TCP_01	kWh	0,13	#VALORE!
T4		#sum_T4 kWh+ 01 - TCP_01	kWh	0,10	#VALORE!
Total Active Power		#VALORE!	kWh		
Total Reactive Power		#sum kvarh+ 01 - TCP_01	kvarh		
threshold 1 for the reactive energy		#VALORE!	kvarh	150,00	#VALORE!
threshold 2 for the reactive energy		#VALORE!	kvarh	160,00	#VALORE!
Powers					
Max Active power T1		#max_T1 Ptot 01 - TCP_01	kW		
Max Active power T2		#max_T2 Ptot 01 - TCP_01	kW		
Max Active powerT3		#max_T3 Ptot 01 - TCP_01	kW		
Max Active power T4		#max_T4 Ptot 01 - TCP_01	kW		
Totals					
Total					#VALORE!
Total % IVA	20				#VALORE!
TOTAL €					**#VALORE!**

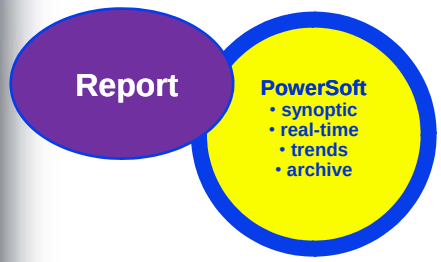
2

Report functionality allows:

- ▼ to export all acquired data in an Excel file.
- ▼ to customized the desired Report using according both to the customer's requirements and to the application.
- ▼ Extremely flexible and easy to use.

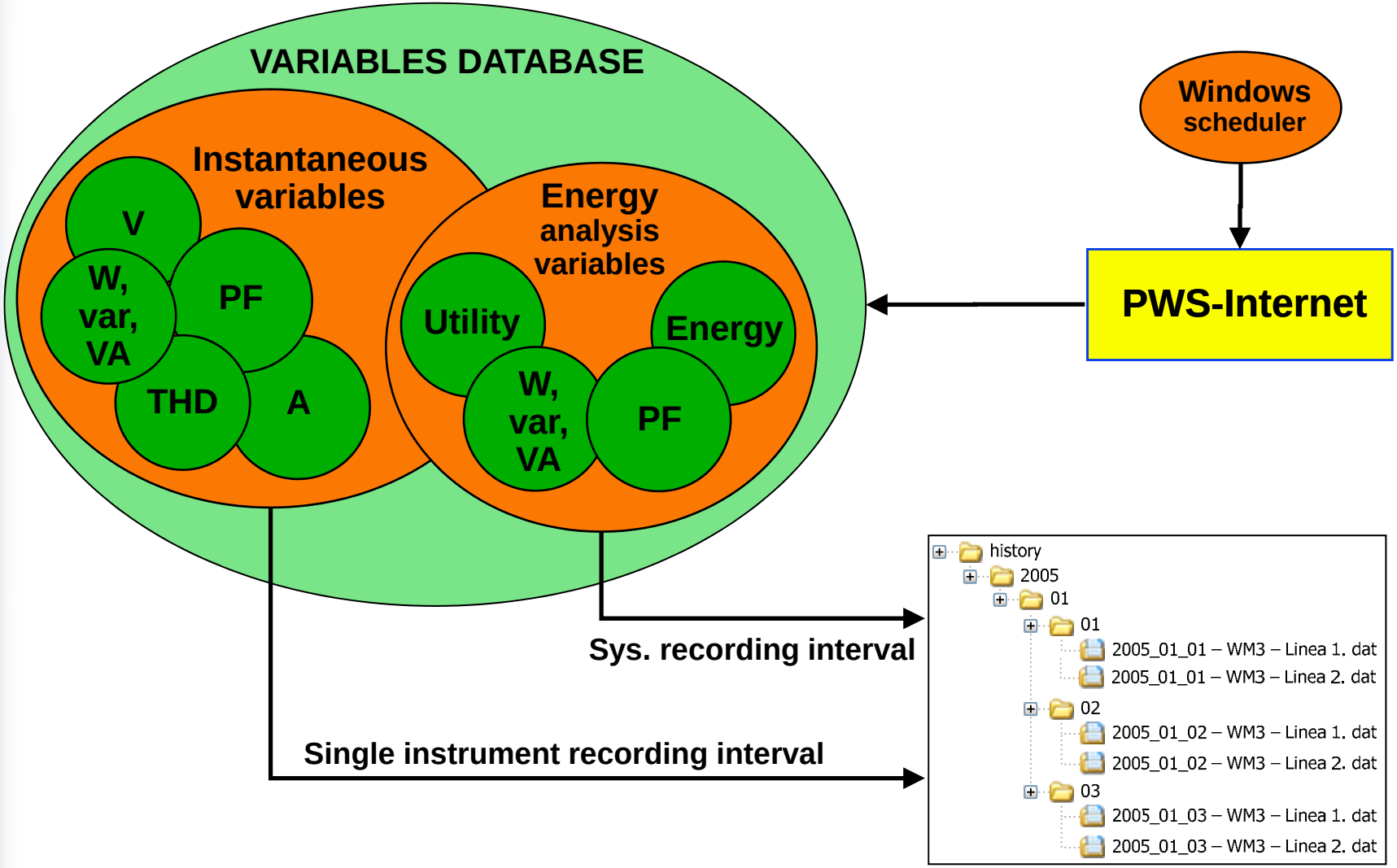


3



Control

The variables database (PWS-Internet mode)



The communication accessories

VCP-DIN

- Virtual communication Port
- Easy configuration with proper installation software
- RS232, RS422, RS485 over Ethernet
- Remote control of your network via LAN or Internet

SW1	Serial nection	SW1	SW2	Interface Mode
ON	Console (19200,N,8,1)	--	--	RS - 232
OFF	Data Comm.	OFF	OFF	RS – 232
		OFF	ON	RS - 422
		ON	OFF	RS – 485 by RTS
		ON	ON	RS –485 ADDC

The communication accessories

SIU-TCP2

- Virtual communication Port
- Easy configuration using the proper installation software (Serial Manager)
- RS232, RS422, RS485 over Ethernet
- Remote control of your network via LAN or Internet

The communication accessories

SIU-PC3

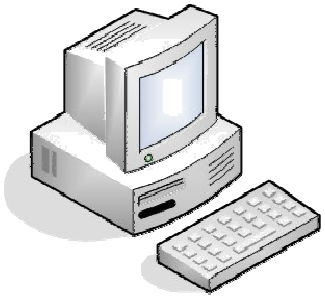
- USB/RS485 Converter
- Plug and play USB Port (once the driver has been installed)
- No configuration

The communication accessories

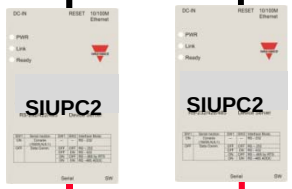
SIU-PC2

- **RS-232 to RS-422/485 Converter**

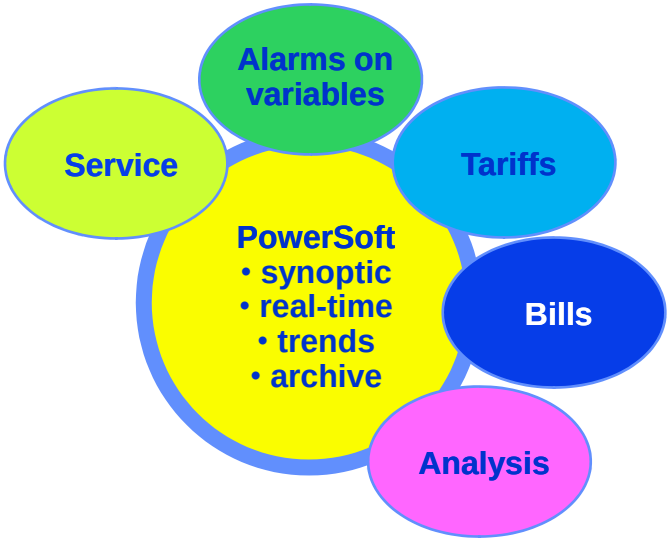
The communication “RS485 via COM port”



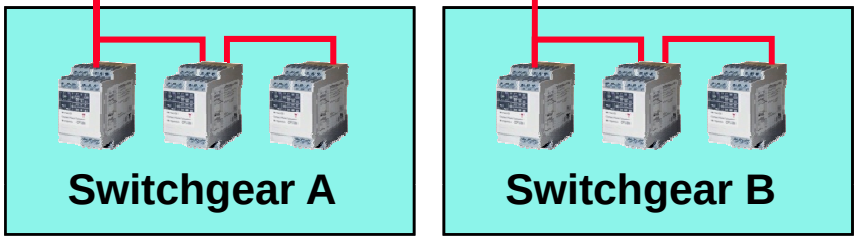
COM 1 COM 2 (RS232)



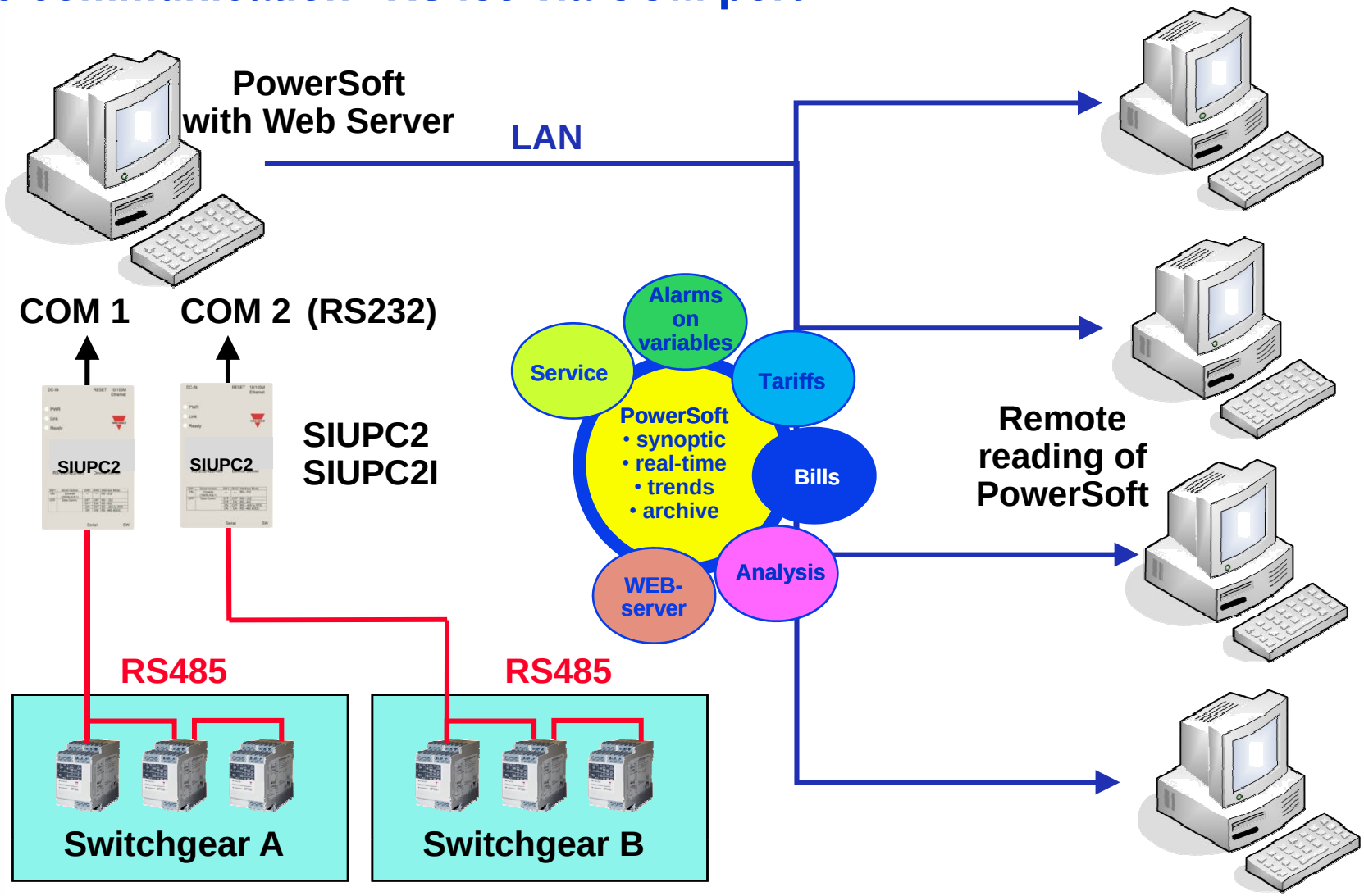
SIUPC2 / SIUPC2I



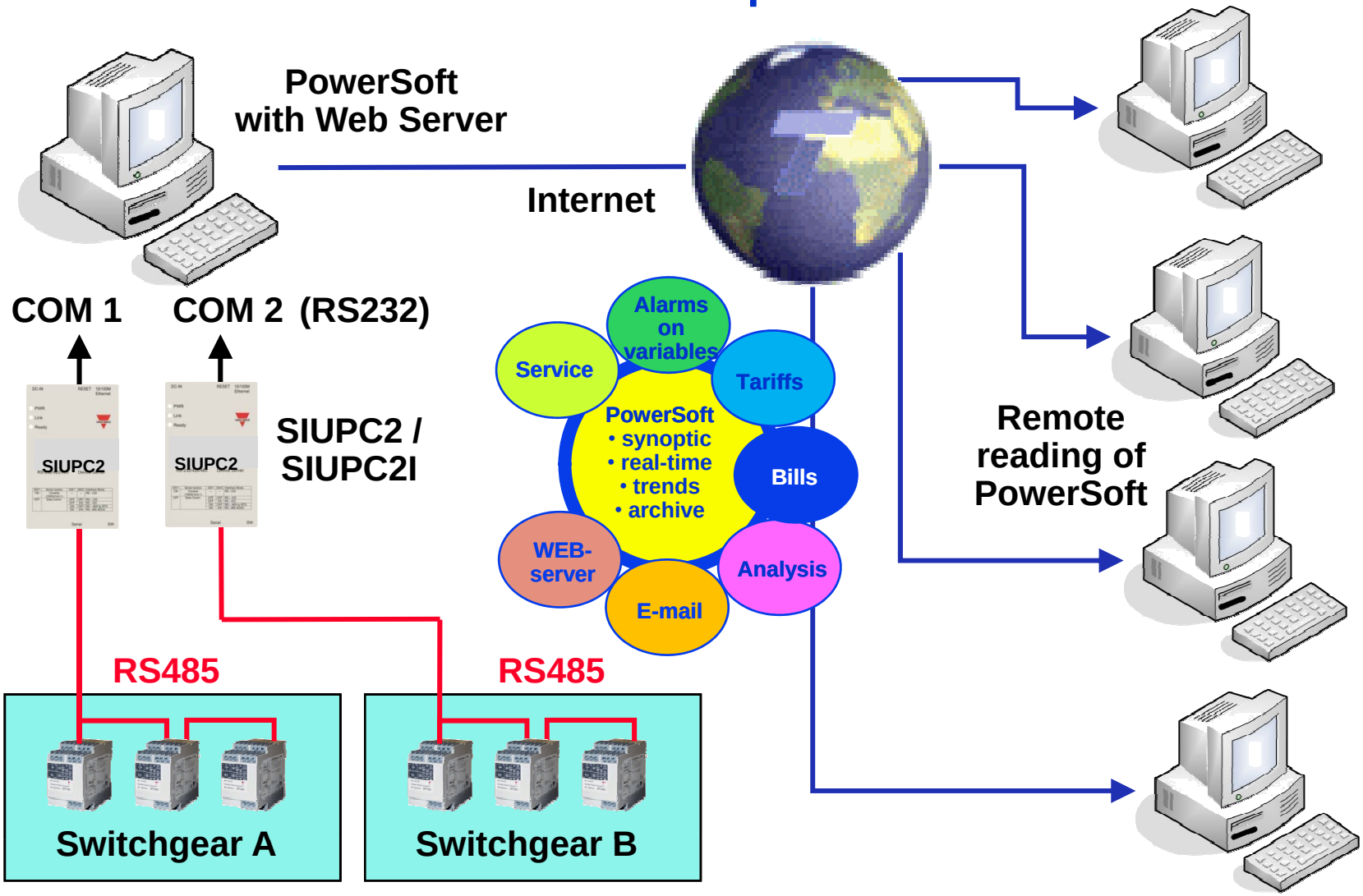
RS485 RS485



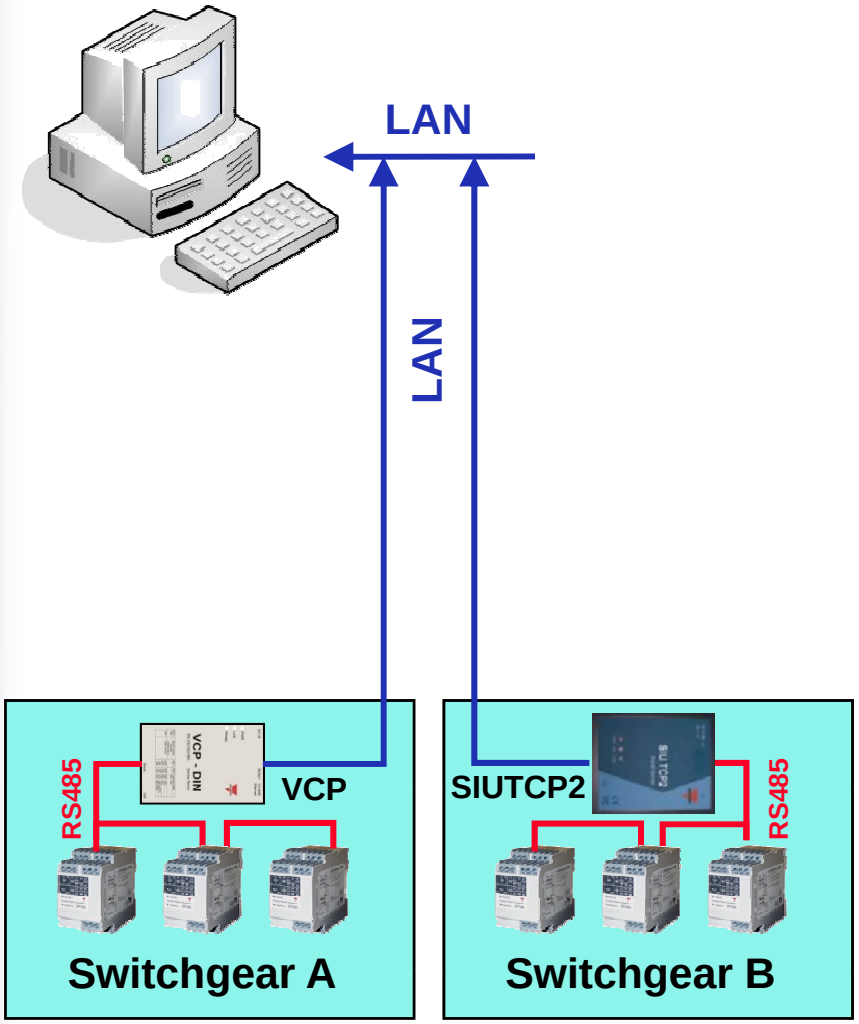
The communication “RS485 via COM port”

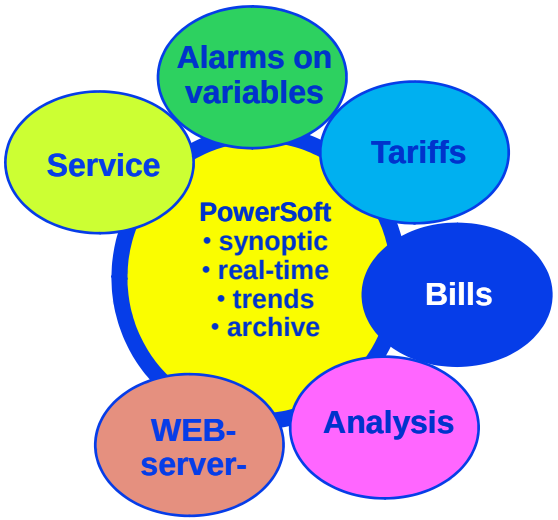


The communication “RS485 via COM port”

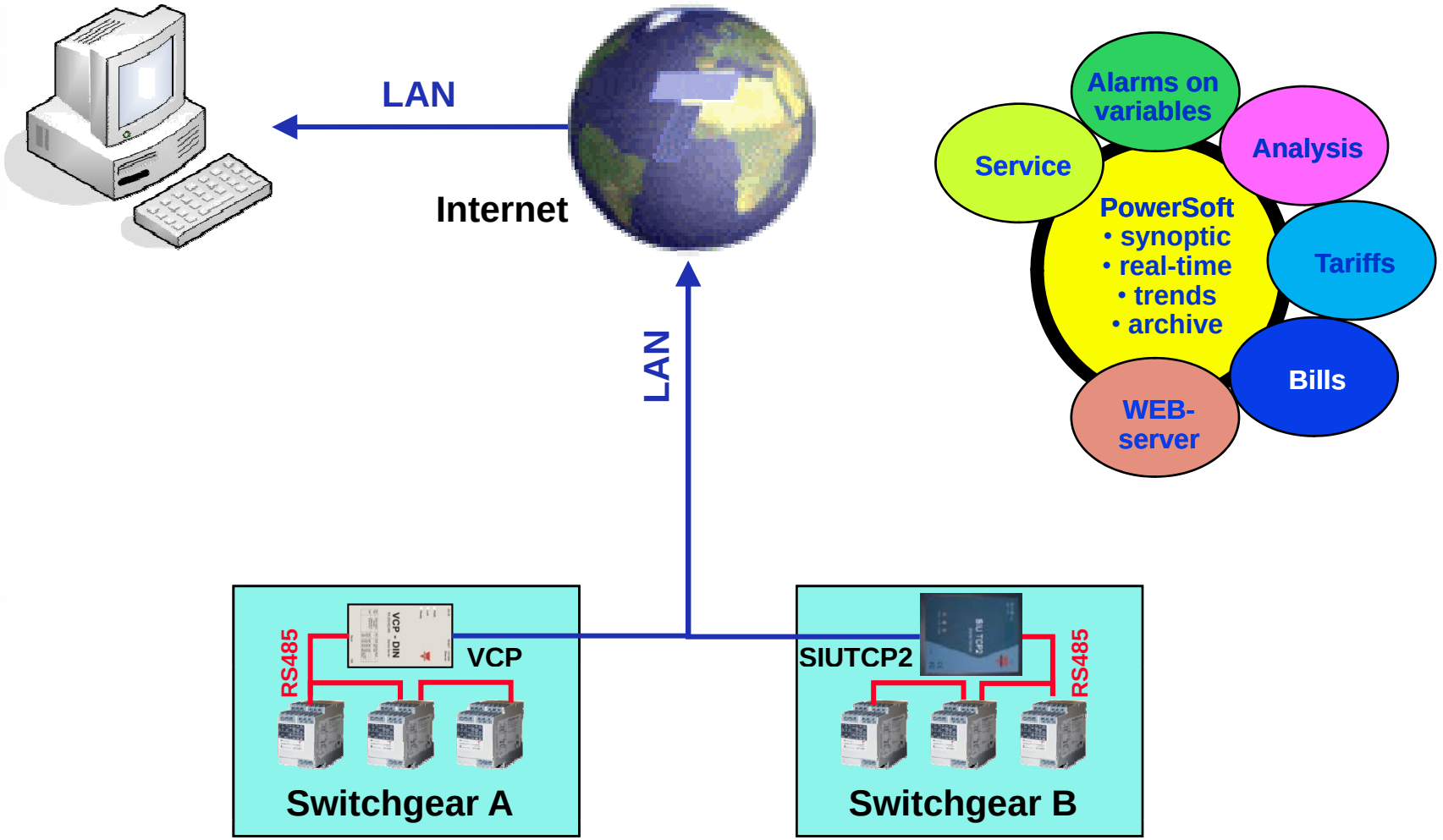


The communication “RS485 via LAN”





The communication “RS485 via LAN”



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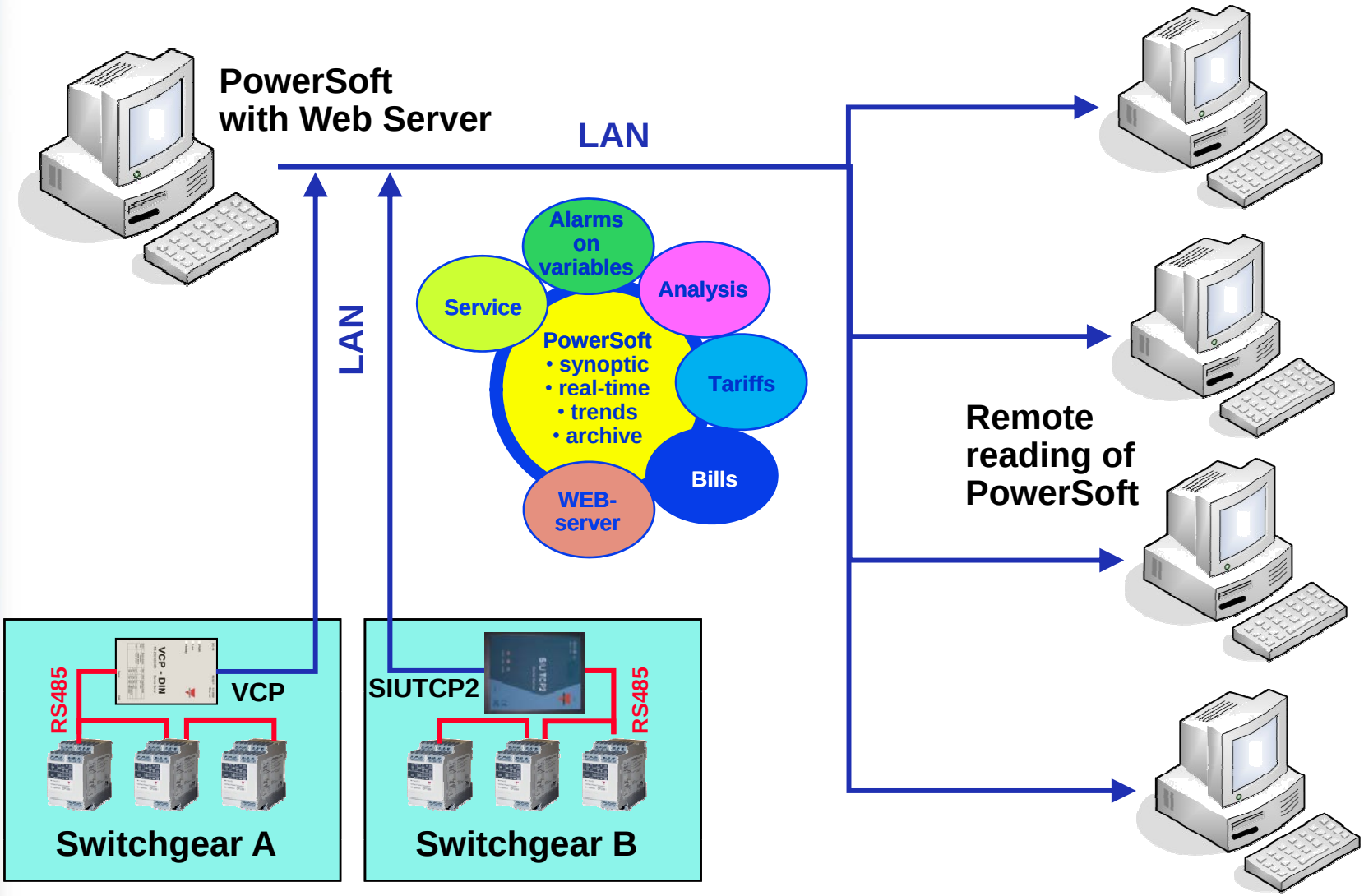
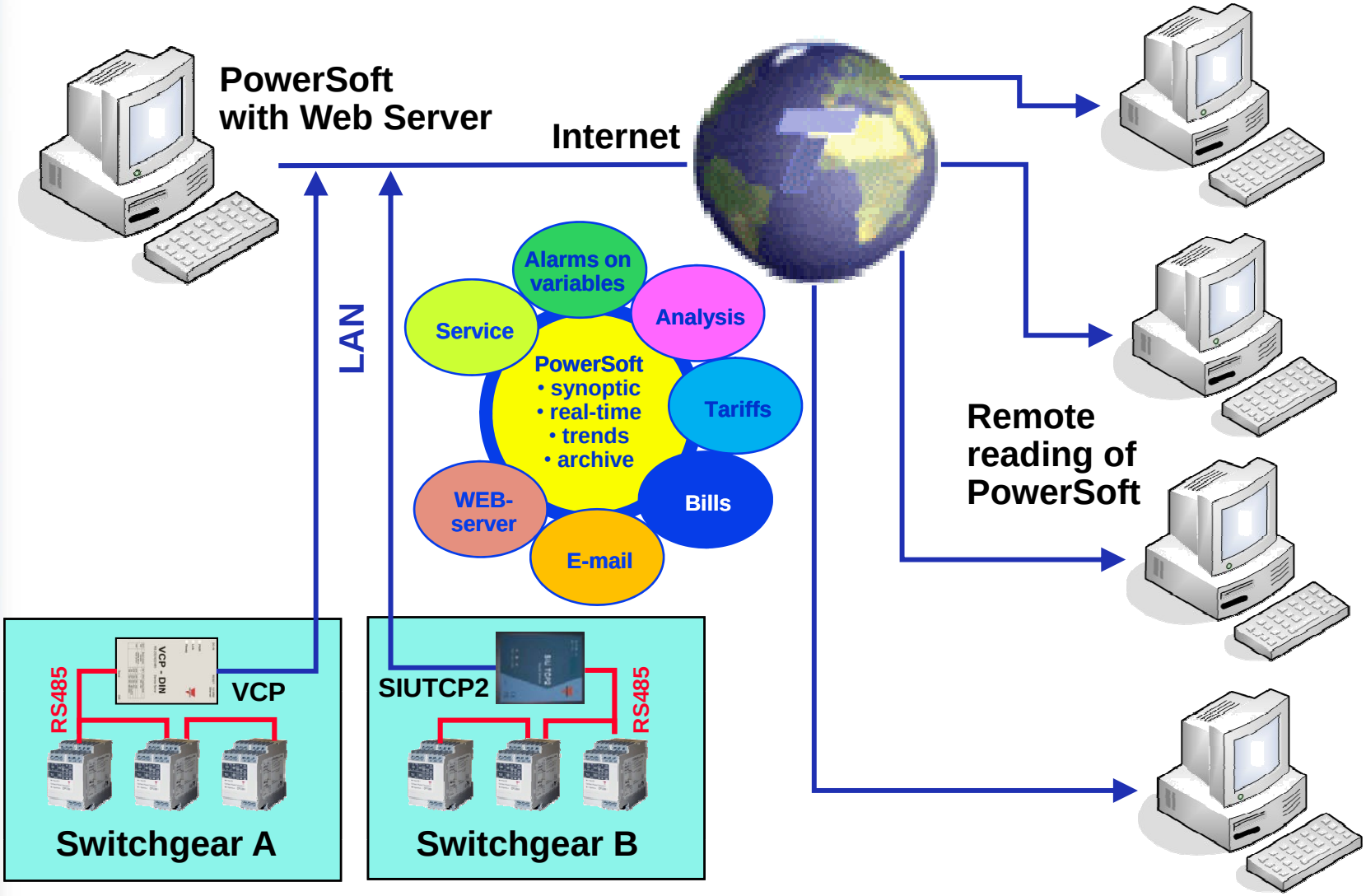
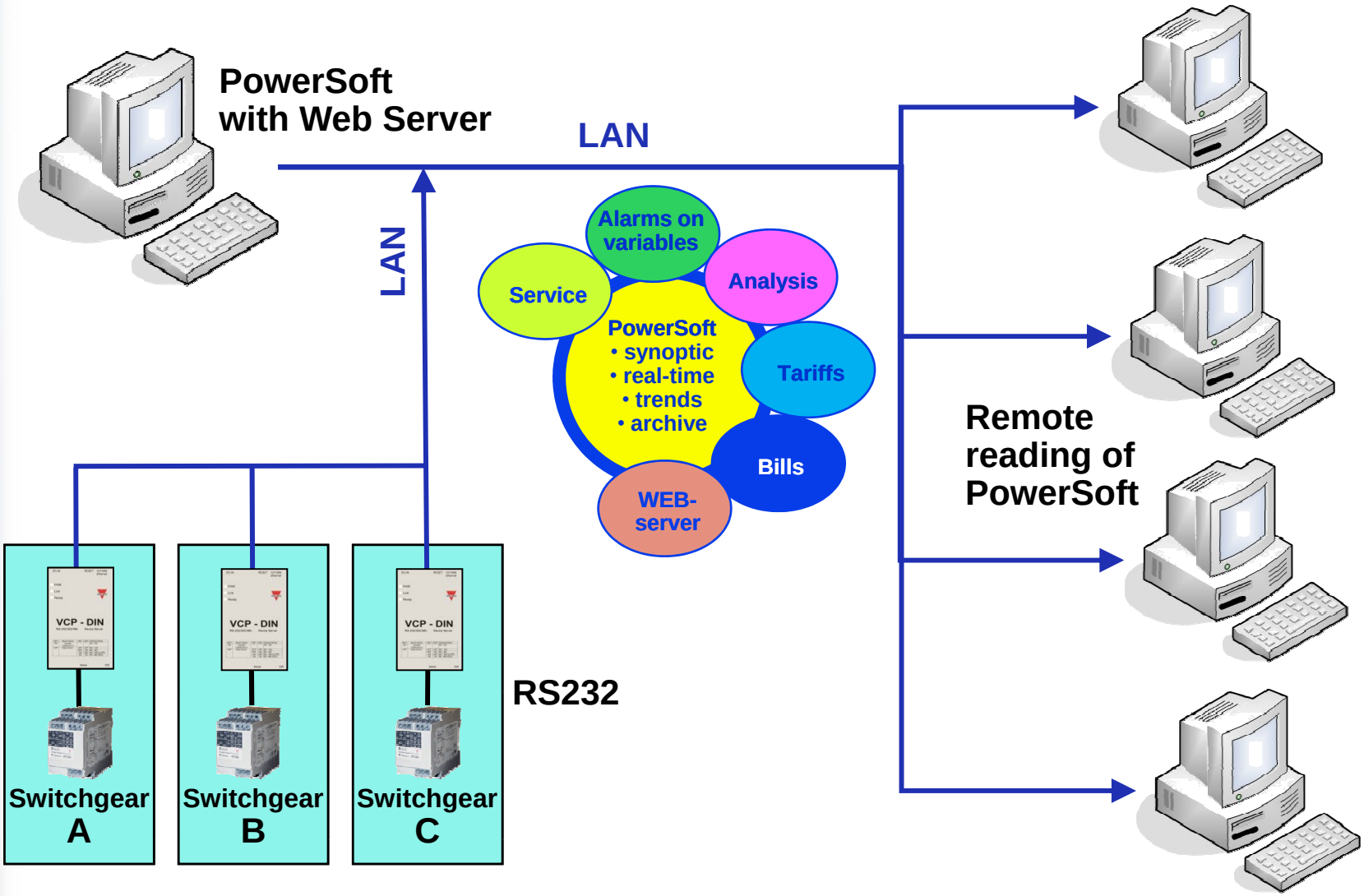


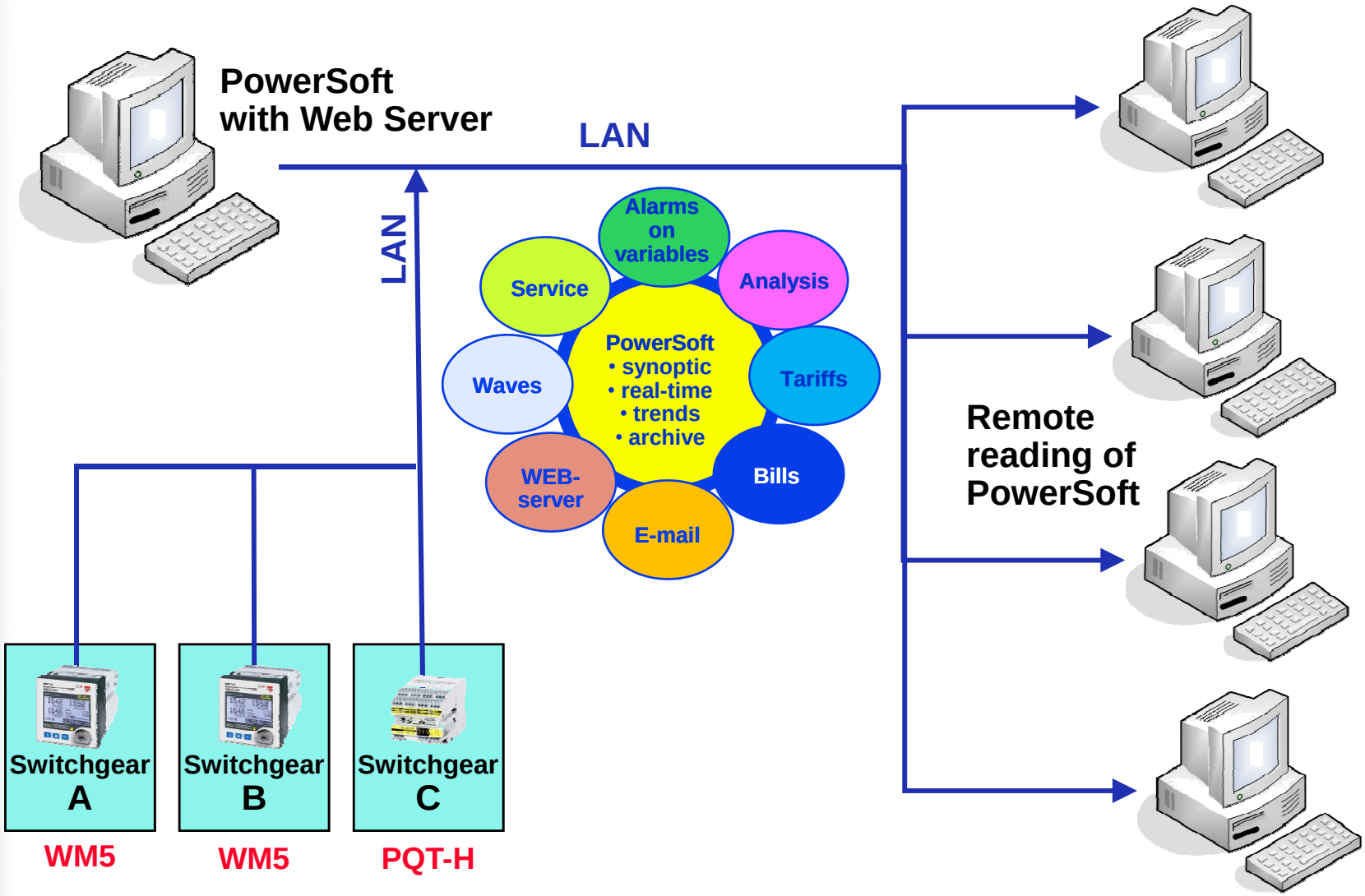
The communication “RS485 via LAN”



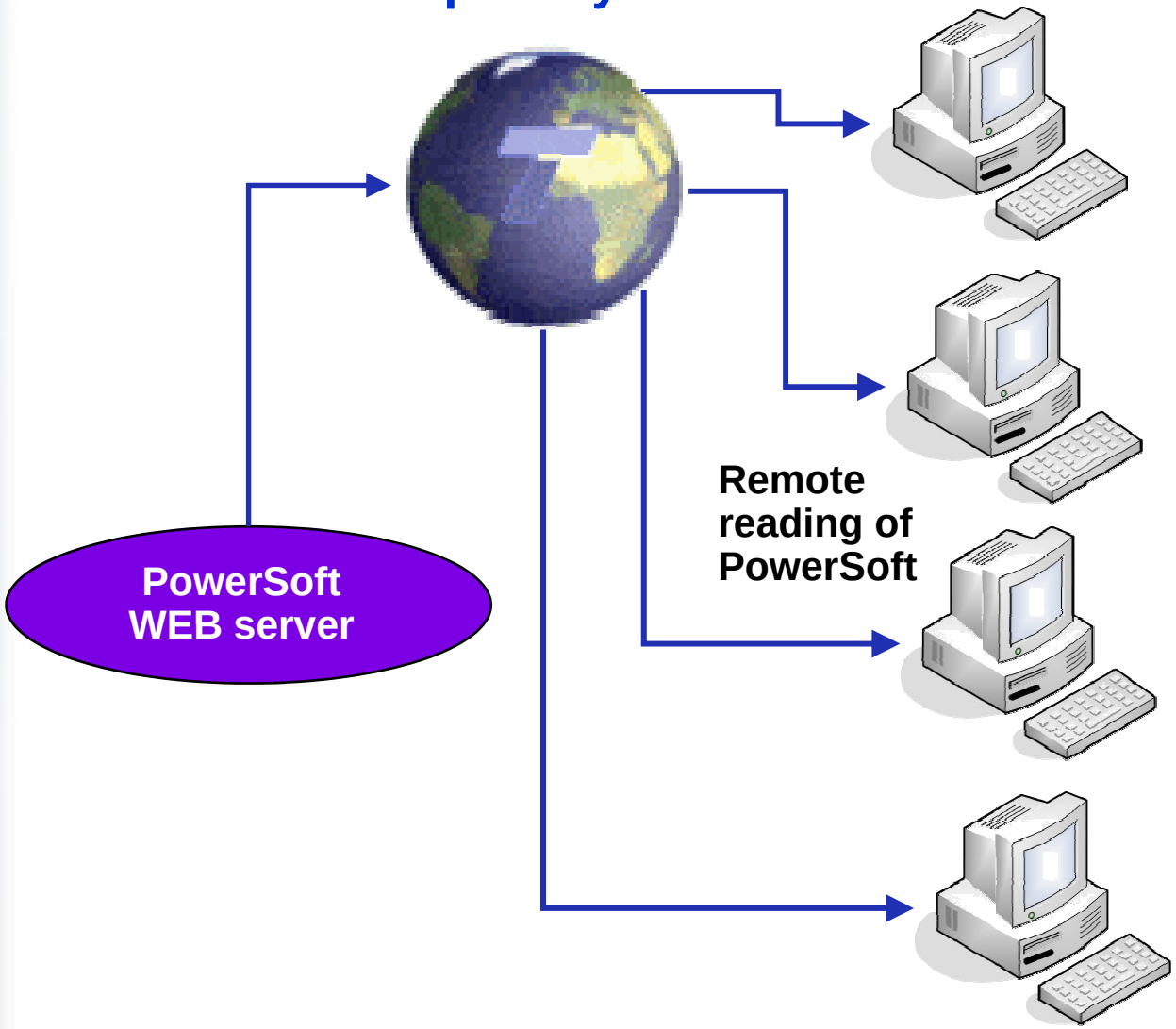
The communication “RS232 via LAN”

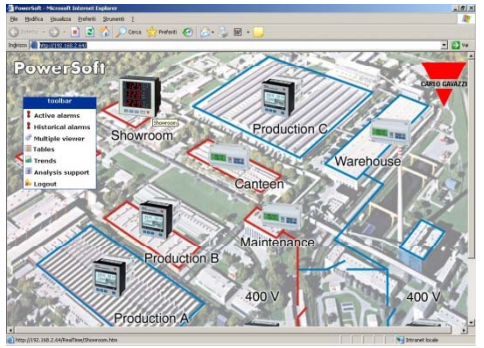


The communication “Direct LAN connection”



The web-server capability



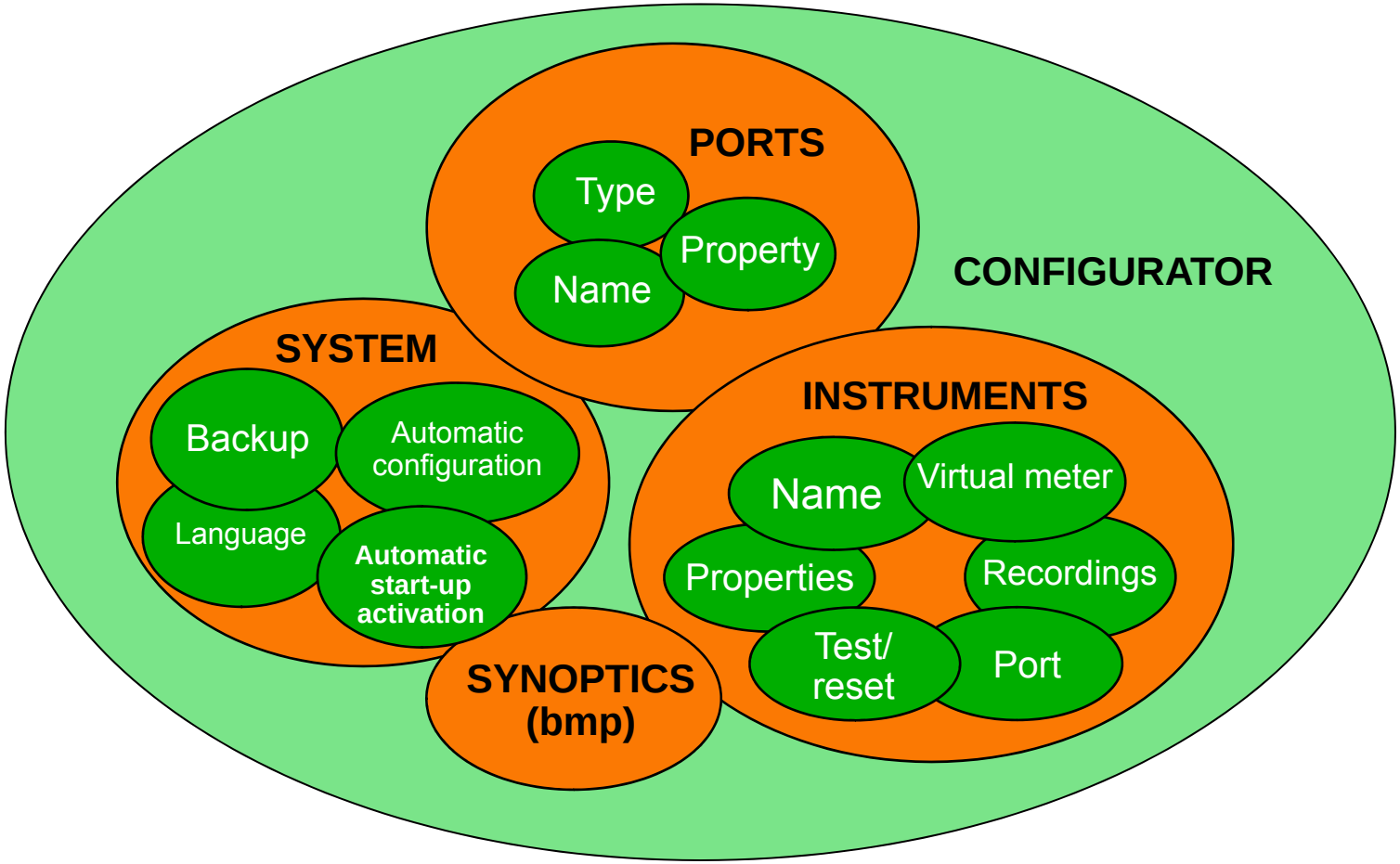


- Standard browser
- Up to 100 simultaneously user connection

Feature and Benefits

- Modular software, easily suitable to the application needs
- Possibility to add, anytime, a proper plug-in when really needed by the application, saving money.
- Complete alarm plug-in with filtering capability so to easily carry-out a real time installation, load and communication network control. As a consequence the operator can promptly decide and plan any maintenance action, thus avoiding possible damages to the loads and/or expensive stopping of the machinery.
- Powerful power demand (kW_{dmd}) trend analysis with different statistical tools for accurate Load Profile evaluation and Utility best-contract negotiation.
- Cost management with complex multi-tariff capability and cost estimation tool. The customer is able to estimate the energy-gas-water bill in a while.
- Internet connectivity with automatic E-mailing able to notify the electrical system status based on alarms or specific events. The WEB server capability allows the user to remotely access the real time information and historical data using a common internet browser, anytime, everywhere.

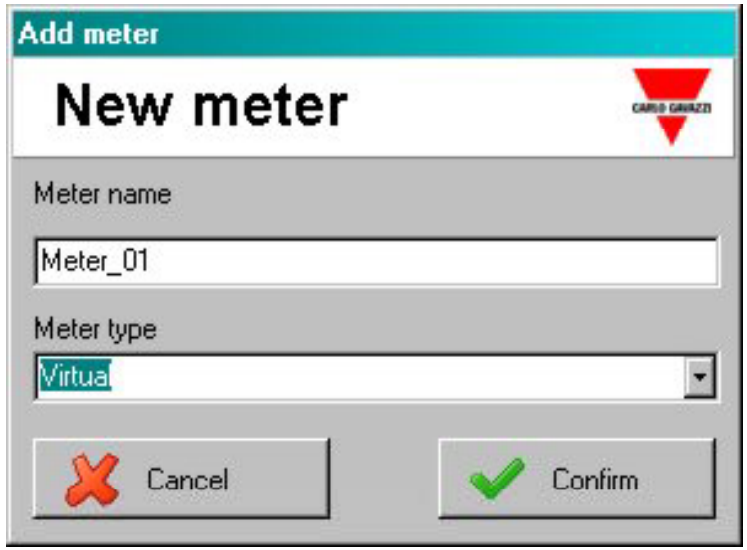
The configurator



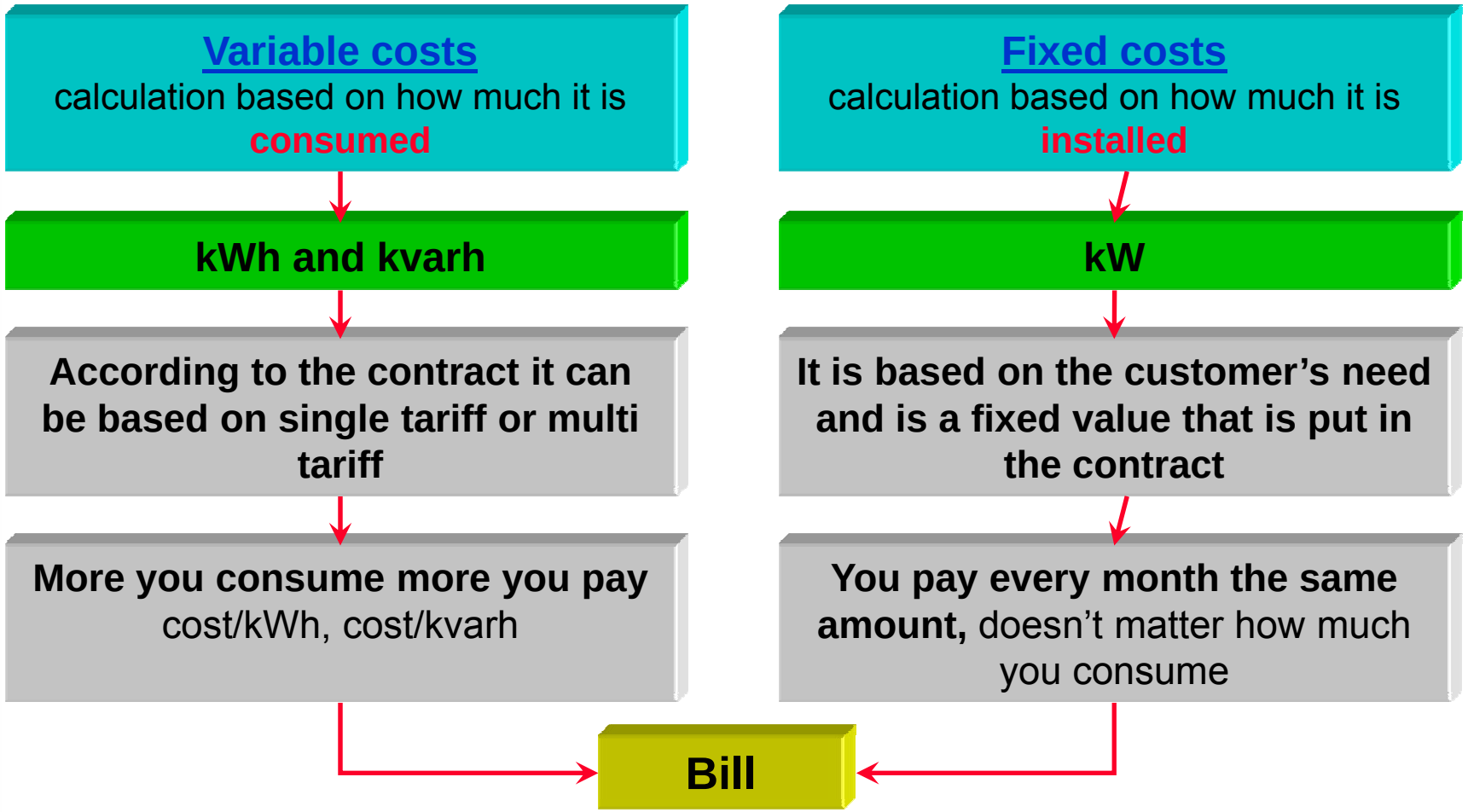
WHAT IS A VIRTUAL METER?

- It isn't a real (existing) meter
- It allows to sum or to subtract variables related to different meters
- Which variables? All Available ones? NO
- What's happen if the user defines variables different from those that can be used for the virtual meter?
- The virtual meter will not calculate their sum, but it will display their value separately.

How is it possible to define a virtual meter?



The structure of the energy cost calculation


Variable costs
calculation based on how much it is consumed
kWh and kvarh
According to the contract it can be based on single tariff or multi tariff
More you consume more you pay
cost/kWh, cost/kvarh
Fixed costs
calculation based on how much it is installed
kW
It is based on the customer's need and is a fixed value that is put in the contract
You pay every month the same amount, doesn't matter how much you consume
Bill

The variables used by the supplier to calculate the energy bill